MAY 23 1938

May 23, 1938

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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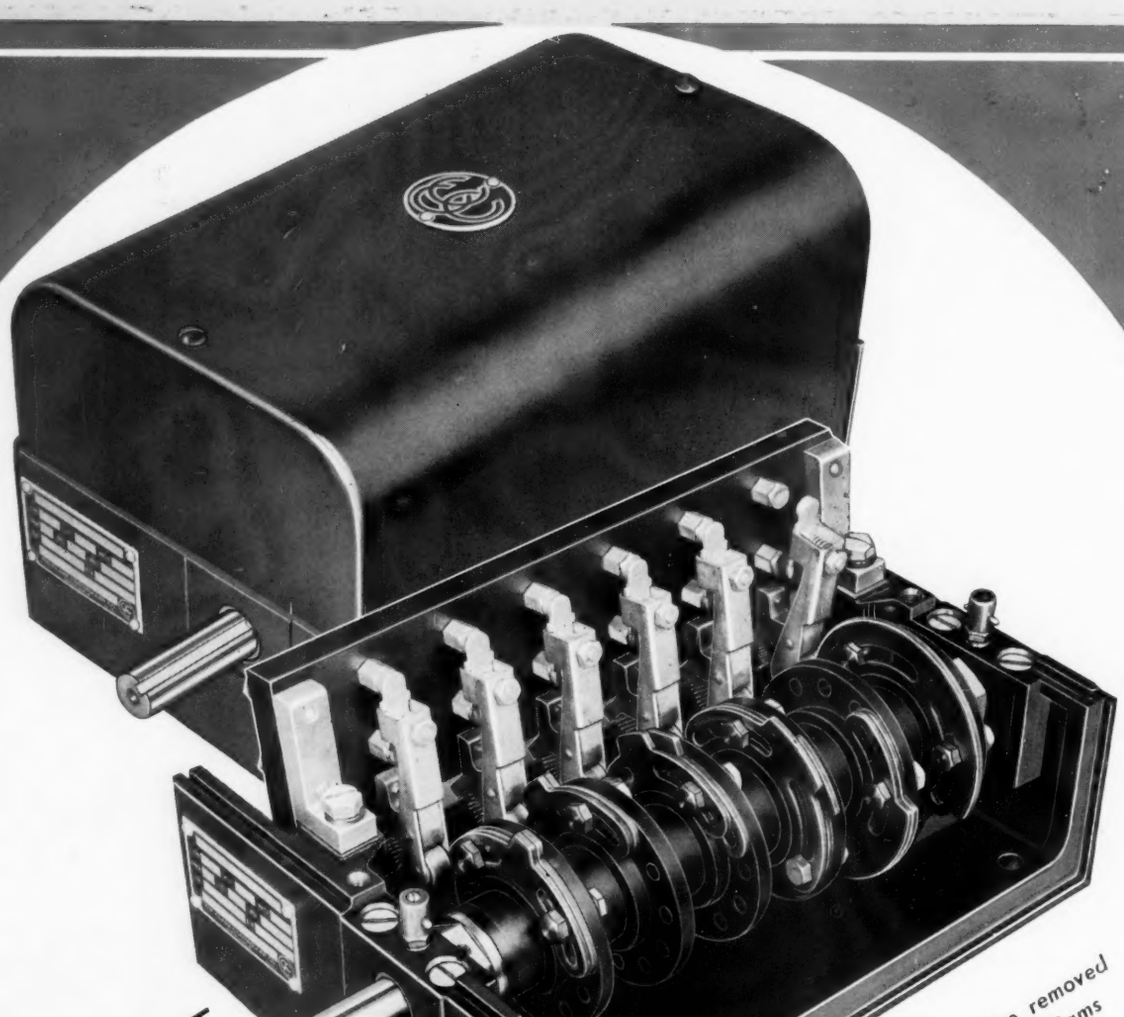

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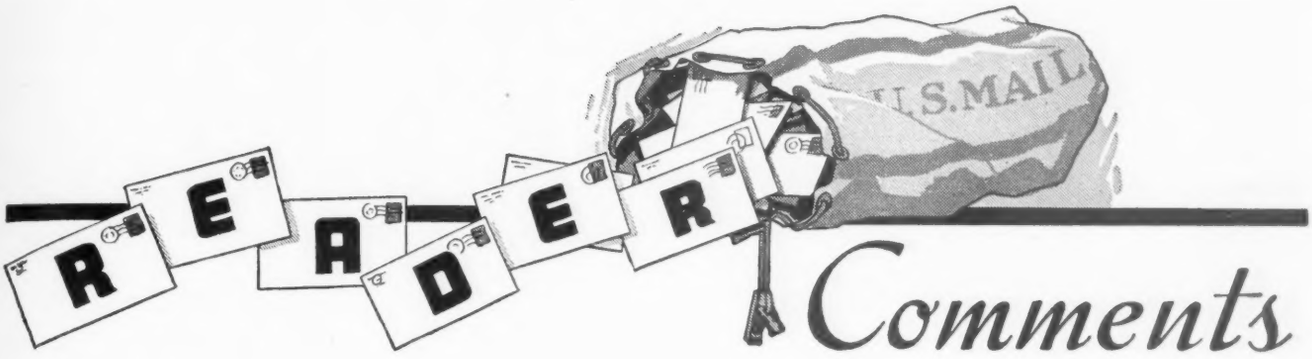


Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Annual Wage Problem

To the Editor:

In regard to the much debated principle of a guaranteed annual income for workers, those who have been discussing this matter do not define what they mean. Presumably it is the guarantee of a definite number of dollars in return for what must necessarily be an indefinite productivity.

In my opinion, an attempt to guarantee say, 1000 men (or any number) a fixed sum during a year to come, *i.e.*, $1500 each, can only result in either a serious impairment of capital (which will react on labor the following year) or in a displacement of workers far in excess of anything we have yet observed.

Conditions are different in the consumer goods and durable goods industries.

A well-known manufacturer of consumer goods operates on a principle known as a "guaranteed annual wage" but it is understood that this wage is not fixed but may be scaled upward or downward at any time during the year, depending on profits.

It is also understood that in that particular business the production per annum ranges from a probable low of 85 per cent of normal to a high of 110 per cent. This is in marked contrast to conditions existing in most of the durable goods industries where it is not unusual to have the range vary from 20 per cent of normal as a low to 150 por cent of normal as a high.

Therefore, I believe that any attempt in a durable goods industry to fix annual dollars is certain to be disastrous to all concerned. The only item which could be fixed without certain ruination, is a percentage of "value added" which will be disbursed as payrolls, allowing the resulting dollars to fluctuate with conditions.

The fact is that the annual wage, if fixed in dollars is open to precisely the same objections as the fixed hourly wage scale and will have the same disastrous results. It is obvious that success in its application will be limited by the ability of management to predict the future for 12 months ahead, and obviously again, payrolls must be limited by the sum collected from customers, which is unknown in most businesses and which is even more uncertain when fundamental laws of economics are tampered with by politics.

I believe that the real issue is that of finding a basic compensation principle for labor as a group; one which will do for industry and labor what the differential wage has done, and will not set up economic rigidities.

This can possibly be arrived at through the principle advanced by A. W. Rucker, in his book *Labor's Road to Plenty*, in which he suggests that compensation be based on labor's share of production. It is quite probable that this can be worked out, provided the necessity of setting up reserves, for the period when wages must be paid and no profits are made, is recognized.

N. W. PICKERING

President,
Farrel-Birmingham Co. Inc.,
Ansonia, Conn.

Defense Plans Hampered

To the Editor:

With the government looking to industry as a first line of defense in case of aggression against the United States, asking that it be ready to produce munitions promptly in quantities, and on the other hand hampering industry in every way, preventing it from equipping efficiently, what is the answer?

In spite of the burdensome restrictions that have been imposed by the government, when national defense is involved, there can be but one answer. We will adjust ourselves to these handicaps as best we can and carry on. The officers in charge of planning have a clear understanding of the problems involved and are handling this most important task in a wise and constructive manner.

They have our confidence and our unstinted co-operation. But they cannot carry out their plans unless money is available for the purpose. The appalling obsolescence in government arsenals and yards cannot be corrected unless substantial appropriations are made for that purpose. And we can not postpone this until the emergency arises; that is too late. A citizen who opposes the purchase of equipment for the town fire department may change his mind very suddenly when his own house catches fire, but that won't save his home.

HOWARD W. DUNBAR

President,
National Machine Tool Builders Association,
Cleveland.

Salesman Key to Prosperity

To the Editor:

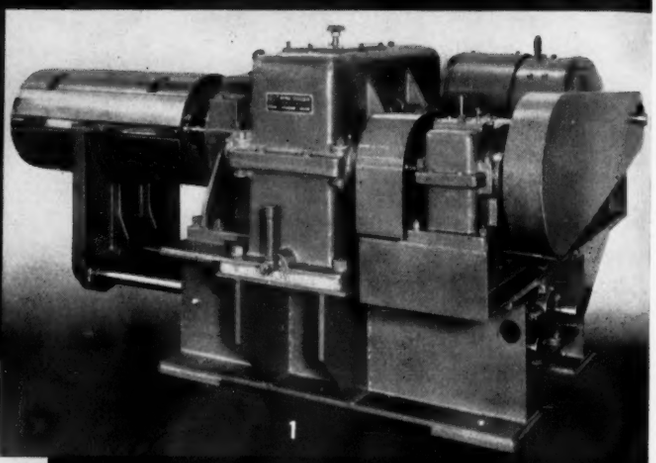
It is the belief of this corporation that a simple formula will help restore employment, purchasing power and prosperity to this nation.

The formula consists in building the American salesman's morale to a point where he believes, as we do, that he is a figure of prime importance in our economic scheme.

We are convinced, and we want to instill this conviction in the minds of those who contact the ultimate

(Please turn to Page 89)

Coilers



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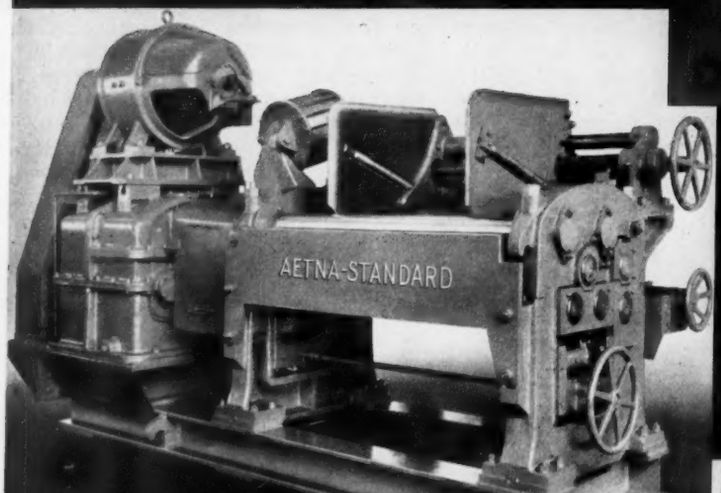

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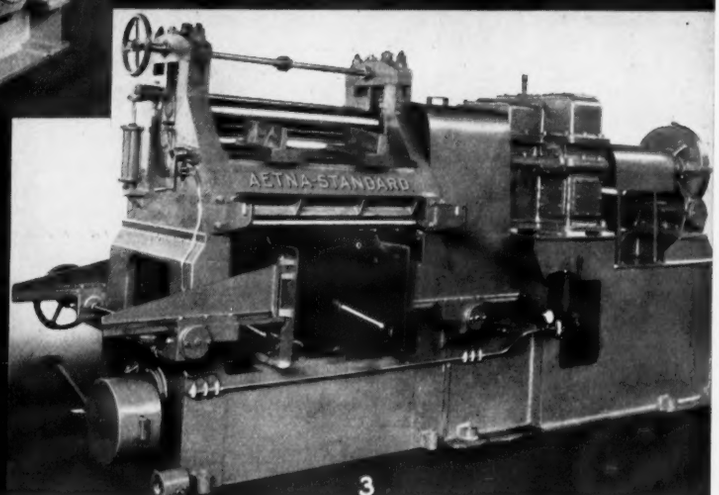
1 . . . TITE COILER

2 . . . UP COILER

3 . . . DOWN COILER



3

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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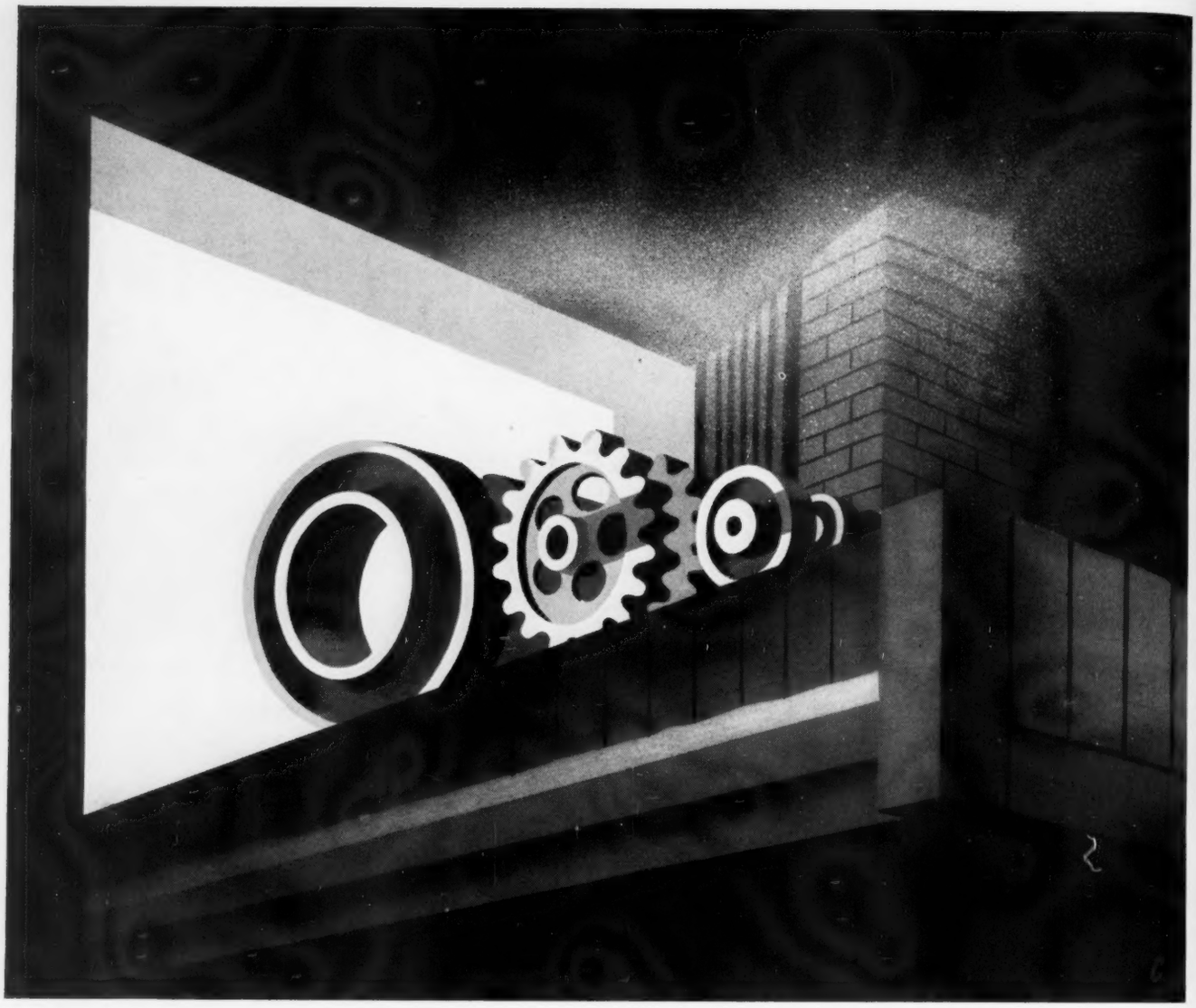

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As the Editor Views the News

■ THURSDAY of this week is set aside for the annual gathering of the clan. On that day members of the American Iron and Steel institute will assemble at New York (p. 22) to take part in an unusually replete program. In addition to the usual technical session, a commercial session has been scheduled. . . . Steel production last week (p. 26) was at 30 per cent, unchanged from the week before. . . . Steel prices, except on certain flat rolled products, have been reaffirmed (p. 75) for third quarter. The new sheet and strip prices are designed to correct certain inequalities that have grown up with the development of the continuous mill. While the new prices are both higher and lower than the old, the new level is about the same on an average.

• • •

Ask Veto of Old Order

Fourteen years ago the federal trade commission ordered the United States Steel Corp. and its subsidiaries to cease and desist from the practice of quoting Pittsburgh plus. The Steel corporation at the time complied insofar as it thought practicable, establishing a number of new basing points marked by differentials over the Pittsburgh price. The commission never took any further action. Recently congress amended the federal trade commission act, providing all the commission's orders would be enforceable May 21 unless appealed prior to that date. Last week the Steel corporation and subsidiaries (p. 17) filed an appeal with the United States circuit court of appeals at Philadelphia. Eventual ruling by the Supreme Court in this historic case is expected.

• • •

Trade Treaty Study Urged

Effects of the devaluation of the franc on American manufacturers are apt to be far reaching and the state department has been requested (p. 34) to determine whether our reciprocal trade treaty with France requires modification. . . . Miller-Tydings law and state fair practice laws in force in 43 states enable manufacturers to brand their goods and enforce resale prices, yet few manufacturers take advantage of this provision for maintaining prices; this point was made at last week's convention of the National Association of Sheet Metal Distributors (p. 19) and a committee was appointed to discuss the matter with makers of steel sheets. . . . Several hundreds of thousands of tons of steel will be required (p. 24) for ships now on ways, under contract and up for bids.

• • •

Irons Benefit By Research

Exhibitors at the foundry exposition in Cleveland last week were heartened by large and interested attendance and are confident that sales of foundry equipment will reflect an improvement. Technical discussions at the convention of the American Foundrymen's association revealed (p. 38) that castings consumers are being benefited by foundry research. Stronger irons now are available commercially. Enameling of cast iron has progressed from a better understanding of design and foundry practice factors. . . . At the recent meeting of the British Iron and Steel institute (p. 46) it was shown that English steelmakers have made progress in reducing fuel consumption but are concerned over lack of refractories that will serve efficiently at high temperatures required for tonnage production.

• • •

New Process Saves Fuel

By a new process, slag from the open-hearth furnace is kept hot so that it flows by gravity into an auxiliary pocket from which, by removing a section of the roof, it is lifted in large blocks without interrupting operation of the furnace. The main slag pocket is free of slag at all times, resulting in lower fuel consumption and greater furnace efficiency. . . . A new interplant shipping system (p. 49) has reduced total materials handling cost at a large metalworking plant to one-fourth of what it had been. . . . A new block of demonstration apartments in London (p. 52) is largely of welded steel construction. . . . Steam-engine drives (p. 58) provide low power costs at many plants. . . . At a metalworking plant advantages have been obtained (p. 66) by laying out all lineshafts parallel and close together.

E. L. Shaner

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Ryerson certifies to the known uniform high quality of all steels in stock—from the thinnest sheet to the heaviest plate—from the smallest bar to the largest beam. In addition, we have developed a special alloy steel service that is a big help in securing desired heat treatment results. Whole heats of ideal close range analysis are selected for each S.A.E. number; special data sheets showing chemical and physical properties, grain size, cleanliness rating and actual results of heat treatment tests, are sent with every shipment of Ryerson Certified Alloy Steels. This complete information makes guessing or testing unnecessary. The heat treater knows the characteristics of the steel. He does not take chances and he gets better results in less time. There are many other advantages. Let us tell you the complete story. Write for booklet R7.

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Larger Attendance, More Attractive Exhibits Feature Foundry Convention

■ ALTHOUGH demand for castings has fallen sharply in recent months and foundry operations are at a discouragingly low level, the industry is directing efforts to improving its products so that any upswing in business will find it prepared to meet requirements. This was evident at the forty-second annual convention and exhibition of the American Foundrymen's association in Cleveland last week.

Total attendance throughout the five days was about 9000, which exceeded the figures for the Milwaukee and Detroit events of the past two years. The show, while not the largest the association has held, featured over 200 exhibits and was completely representative of the foundry equipment and supplies field.

Occupying the entire Lakeside exhibit hall of Public Auditorium, the show was outstanding for its attractive appearance, with modernistic booth designs and settings. Products exhibited included molding machines, sand preparation equipment, melting units, materials handling machinery, metallurgical and control instruments, metals, refractories, and safety devices. Much of this equipment was in operation.

Sessions of the convention were compacted into four days. All branches of the foundry industry were given attention, these including steel, malleable, gray iron, nonferrous, management, apprentice training, safety and hygiene, refractories, sand, and shop operation.

The convention was opened Monday at a meeting at which President Hyman Bornstein, director, testing and research laboratories, Deere & Co., Moline, Ill., presided. Bertram G. Parker, Youngstown Foundry & Machine Co., Youngstown, and general chairman of the Northeastern Ohio chapter committee, welcomed members and guests of the association to Cleveland. Mayor Harold H. Burton also extended greetings.

A new record for an entertainment feature was set Tuesday evening when 2500 foundrymen attended a vaudeville show and buffet lunch in the auditorium. The affair was sponsored jointly by the American Foundrymen's association, Foundry Equipment Manufacturers' association, and North Eastern Ohio chapter of the A.F.A.

Outlines Recovery Program

Warning against "building the house of the future on quicksand" was issued by Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and president, National Association of Manufacturers, in addressing the annual business meeting Wednesday. He proposed a program, which, if followed, he said, "would in a year make us almost forget our present depression."

Mr. Hook had been selected as the first speaker in a series of annual addresses sponsored by the A.F.A. board of awards, purpose being to provide the membership with discussions of public and nontechnical problems.

"The goal of business recovery is worthy of inspiring us to lay aside such transitory obstacles as political differences and unite in bringing about its realization," Mr. Hook declared. "The immediate objective is to put men back to work."

He urged industry to support the following seven-point program, which, he stated, carried the necessary "punch" to restore business activity quickly:

1. Constructive steps by government to create confidence in fundamentals of the private enterprise system.

2. Declaration by the government that it will not proceed in competition with private utilities and will refrain from practices which retard public utility expansion by discouraging investment and purchases.

3. Prompt solution of the railroad problem.

4. Avoidance of new reform legislation that will result in a fresh pe-

God of Water and Barnacle Bill

■ Left, Chinese iron casting "Head of Suikan, God of Water" from Confucius temple, dated 1000 A.D., now in the collection of John W. Higgins, president, Worcester Pressed Steel Co. Right, turbine shell casting just after being taken from mold at General Electric's foundry, Schenectady, N. Y. Its appearance with its protruding arms—risers—led GE to caption this "Barnacle Bill the Diver"

riod of uncertainty at a time when the nation should be concentrating in making jobs.

5. Co-operation between all groups to increase national income.

6. Adequate definition of specific purpose in appropriating of further national funds for relief purposes, with relief funds administered by experienced local agencies to prevent malingering and waste of taxpayers' money.

7. Revision of the Wagner act to make it a workable instrument for curtailing labor disputes.

"Revising the Wagner act," Mr. Hook added, "involves correcting its one-sided character, enforcing responsibility on labor organizations, separating the functions of fact finding, prosecution and judicial decision, and establishing impartial administration by the national labor relations board. There is abundant evidence to support the belief that the flow of private and corporate savings into channels of production and trade is being retarded seriously, awaiting indication on the part of government that constructive amendment of the labor relations act is forthcoming."

On behalf of the A.F.A. and as a mark of appreciation for his address, F. J. Lanahan, Fort Pitt Malleable Co., Pittsburgh, presented Mr. Hook with a bronze statue of Tom Sawyer and Huckleberry Finn.

Frederick A. Lorenz Jr.
Awarded Seaman medal of American Foundrymen's association

Marshall Post
Elected president, American Foundrymen's association

Attendance at the annual meeting was the largest ever attained. Mr. Bornstein presided. Life memberships were voted to Mr. Bornstein and F. A. Lorenz Jr., the Seaman medallist. Cabled messages of greeting from the British and French foundrymen's associations were read by F. G. Steinebach, editor, *The Foundry*, Cleveland, and chairman of the A.F.A. international relations committee.

Marshall Post, vice president and works manager, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., was elected president to succeed President Bornstein. Mr. Post has served as vice president in the past year.

Mr. Post has had an extended career in the foundry industry, beginning as apprentice molder with the American Steel Foundries, Granite City, Ill. Completing the three-year course, he became a journeyman molder with the Commonwealth Steel Co. of the same city, later returning to American Steel Foundries and serving successively as assistant foreman, night foreman and finally foundry superintendent.

In 1918, Mr. Post assumed the position of superintendent of foundries, Marion Steam Shovel Co., Marion, O., but returned to the American Steel Foundries in 1920 as works manager of the Sharon, Pa., plant. Later he was made works manager of the Thurlow plant, Chester, Pa. He has held his present position with the Birdsboro Steel Foundry & Machine Co. since 1925.

Henry S. Washburn, new vice president of the association, is president and treasurer, Plainville Casting Co., Plainville, Conn. Born in Brooklyn, N. Y., he received his early education in St. Paul's school, Garden City, N. Y., then attended Yale university. His first commercial position was as bookkeeper with the Corn Exchange Bank of New York. From 1906 to 1917 he held various positions as clerk, credit man, and office manager with the D. L. & W. railroad, H. B. Claflin

Henry S. Washburn
Elected vice president, American Foundrymen's association

■ **Section in the foundry show featuring the heavier type of equipment. In all, there were more than 200 exhibitors. Displays set a new high for attractive staging**

Co., and Butler Bros., New York. From 1917 to 1921, he was purchasing agent, Turner & Seymour, Torrington, Conn., leaving this post for his present connection.

Mr. Washburn has been active in the A.F.A. for many years, also in local foundrymen's associations in the Connecticut and New England districts. He is a member of the National Founders' society, and Gray Iron Founders' society.

Five directors were elected for three years as follows: H. S. Hersey, vice president and general manager, C. O. Bartlett & Snow Co., Cleveland; F. A. Lorenz Jr., vice president, American Steel Foundries, Chicago; G. A. Seyler, works manager, Lunkenheimer Co., Cincinnati; D. O. Thomas, vice president, Bendix Aviation Corp., South Bend, Ind.; and the retiring president, Hyman Bornstein.

More than 400 attended the annual banquet in Hotel Cleveland Monday. On this occasion, the Joseph F. Seaman gold medal was awarded to Frederic A. Lorenz Jr. in recognition of his leadership and accomplishments in management and commercial phases of castings manufacture and his service to the foundry industry. Because of illness, Mr. Lorenz was not present; the medal was accepted in his behalf by Alfred Walsher, also a vice president of the American Steel Foundries, Chicago.

Mr. Lorenz has been associated with American Steel Foundries since 1911. In addition to his management responsibilities, he has been active in operating departments. He has contributed to technical literature of the industry and prepared the section on "Steel Casting Design" in the symposium on steel castings published by the A.F.A. and A.S.T.M.

(For a resume of technical sessions of the convention see pages 38-40.)

■ Directors of Youngstown Sheet & Tube Co., Youngstown, O., have declared the regular preferred dividend of $1.37½ a share, payable July 1 of record June 11.

Efforts To Enforce Abandoned Order Again Raise Basing Point Issue

■ EFFORTS by the federal administration to revive the dormant 14-year-old federal trade commission order against the obsolete "Pittsburgh Plus" practice last week reached the courts, and were construed generally as another attempt to harass the steel industry.

United States Steel Corp. and four subsidiaries filed a petition in circuit court at Philadelphia to set aside the order.

The court action was precipitated by an amendment to the federal trade commission act, passed March 21, providing the 1924 order would become "final" unless action was taken before May 21 to have it set aside. This of course, involved not only the "Pittsburgh Plus" order, but others issued by the commission against various industries.

"Pittsburgh Plus" was the practice before 1924 of selling products at delivered prices which were equal to the price f.o.b. Pittsburgh, plus an amount equal to the freight charges from Pittsburgh to destination, regardless of the point where such products actually were manufactured.

Many Basing Points Established

Consumers at such producing centers as Chicago objected to paying freight charges from Pittsburgh on steel manufactured in their immediate neighborhood, and insisted they should have a base price at the mill.

In September, 1924, the FTC issued a cease and desist order against the "Pittsburgh Plus" practice. The Steel corporation—and independents—complied "insofar as practical."

Subsequently basing points were established at practically all important steel producing or shipping centers with the buyer paying freight from the nearest center. From this plan arose the present multiple basing point structure under which the steel industry has operated for the past 14 years.

Prices at the new basing points differed from the Pittsburgh quotation. The difference was determined largely by the ability of local mills to supply demand, and necessity for competing with delivered prices based on Pittsburgh.

Consumers apparently were satisfied with the new system, which was only a partial compliance with the FTC order. Few complaints against the system were heard.

Through the past 14 years the FTC has never taken any court action to enforce its order, although the order never has been actually rescinded of record.

Said U. S. Steel's petition:

"The order has been abandoned by the commission, and no longer has any validity. It never has been practical for your petitioners or others similarly situated to comply and your petitioners have not complied with the provisions of said order. The fact of such noncompliance has at all times been known to the commission. Despite such knowledge of noncompliance the commission has never taken any action for enforcement of the order."

More recently, however, the administration saw in the 14-year-old order a chance for an oblique attack on the industry. In an effort to force the issue the federal trade commission act was amended to provide such order would become "final" unless action was taken by May 21 to have it set aside .

Steel industry spokesmen point out that the order was based on practices and conditions as they existed before 1924; that these practices and conditions no longer exist, but have been supplanted by a new system; hence the new system is at stake.

Circuit court at Philadelphia last

week refused the Steel corporation and subsidiaries a stay against enforcement of the order, but pointed out that the appeal protected the corporation against the $5000 penalty provided for violation of the order.

Next step in court proceedings probably will be discussions between corporation officials and the FTC regarding the facts of the situation. Pending outcome of these discussions and final finding of the court, the 1924 order will be in effect suspended.

Heavy Steel Requirements in Navy, Commercial Shipbuilding Plans

■ SHIPBUILDING, running counter to the general business tide, is becoming more important to steelmakers this year.

Normally one of the lesser outlets for steel, it has come in for special attention because of the administration's $1,156,000,000 navy expansion bill now up for the President's signature; the award of twelve C-2 cargo ships; the recent opening of bids on four C-3 cargo boats; and the scheduled opening of bids June 22 on eight destroyers and six submarines.

These destroyers and submarines, half of which are to be awarded to private yards, are the first of the navy program for the fiscal year ending in 1939 and will later be followed by two battleships, two cruisers, one oiler, one mine sweeper, one submarine tender and one fleet tug. Keels for the two battleships may be laid by July 1.

Navy and merchant work included in the foregoing probably will require 240,000 tons of steel, to be purchased over several years.

Improving the outlook was the placing of approximately 210,000 gross tons of merchant ships in the first quarter of 1938. This was in addition to 291,289 gross tons of merchant ships and 282,200 displacement tons of naval vessels on the ways Jan. 1, the best backlog in many years.

Specifications Slow

Figuring on a ratio of two-thirds steel for every gross ton, the amount of steel required for the merchant ships awarded in the first quarter of this year is estimated at 140,000 tons, with 80 to 90 per cent hull steel. This tonnage will be released gradually. Much of the steel for work on the ways Jan. 1 is yet to come out.

Slowness of specifications will be particularly true of the navy work. Here, where displacement instead of gross tons are cited, one-third ton of steel is figured for each displacement ton.

Of the twelve C-2 cargo ships recently awarded and requiring a total of approximately 43,200 tons of steel, mainly hull steel, four went to the Tampa Shipbuilding & Engineering Co., Tampa, Fla. This award was made on bids submitted Feb. 1.

Of the remaining eight, on which new bids were asked May 3, four were placed with the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and four with the Sun Shipbuilding & Dry Dock Co., Chester, Pa. Four other ships of the same type were bid at the same time, but action has been delayed until the United States maritime commission is able to investigate the facilities of the Pensacola Shipbuilding Co., Pensacola, Fla., a relatively new organization.

Bids were opened May 17 on four C-3 ships, requiring approximately 16,000 tons for the American Export Line Inc., New York. These are the first of ten which the company is to build under a federal operating differential subsidy, with the proposals being handled by the maritime commission.

Require Large Tonnage

The 12 cargo boats recently placed, plus the four on which bids were just opened for the American Export Line Inc., and the four on which the Pensacola company's bid is now being considered, will require in the aggregate approximately 74,000 tons of steel.

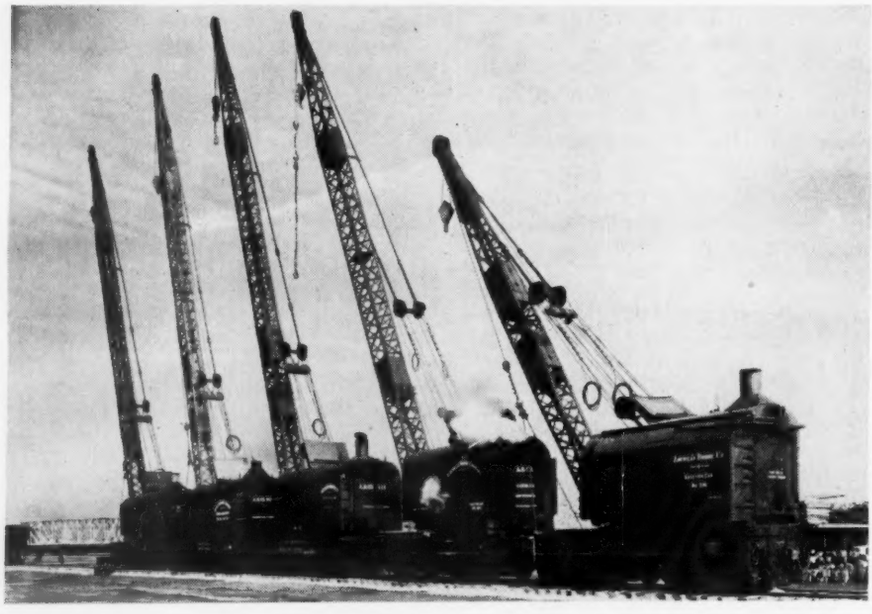
Active also at this time are 30 arc-welded steel scows for the city of New York, the largest list of this type of craft along the eastern seaboard in recent years, and requiring approximately 9000 tons of steel. Bids are in, with early action expected.

Steel requirements of the naval program for the fiscal year ending in 1939, and to get under way in June, probably will take 40,000 tons of steel, or one-third of the total displacement of 120,000 tons.

The naval expansion program embodied in the bill, now up for the President's signature and which provides authorization only and no appropriation will require approximately 130,000 tons.

Details of this program, which involves 72 vessels, including 26 auxiliaries, follow: Three battleships, with a total displacement of 105,000 tons; two aircraft carriers, 40,000 tons; nine cruisers, 68,750 tons; 23 destroyers, 38,000 tons; nine submarines, 13,650 tons; three destroyer tenders, 27,000 tons; three large seaplane tenders, 25,000 tons; seven small seaplane tenders, 11,550

March of the Steam Cranes



■ **Five American Bridge Co. cranes, rigged for erecting operations on press shop of Ford Motor Co., Dearborn, Mich., a structure requiring 26,000 tons of steel. Construction started with a total of ten on the job, and work on the 1650-foot building is now in progress. Photo, US Steel News**

tons; two submarine tenders, 18,000 tons; one repair ship, 9,500 tons; four oilers, 32,000 tons; one mine layer, 6000 tons; two fleet tugs, 2500 tons; and three mine sweepers, 2100 tons.

New Edition of Great Lakes Red Book Ready

■ Thirty-fifth edition of *The Great Lakes Red Book* is just off the presses of the Penton Publishing Co., Cleveland.

It has been improved this year by including the length, beam, depth, and carrying capacity of bulk freighters, with names of captains and chief engineers of all vessels plying the Great Lakes and adjacent waters. Approximately 1600 vessels are listed.

Facilities of shipbuilding and ship repair yards on the Great Lakes are given in detail.

■ Steelworkers in Europe last year had to work from 3½ to 23½ hours to buy a basket of food which American steelworkers could buy with wages received for only 1½ hours of work, according to the American Iron and Steel institute.

Sheet Metal Sellers Seek Better Adjustments in Merchandising

■ PROPER application of functional discounts, determination of cost of obtaining orders and adjustment of business to new legislation were leading topics at the National Association of Sheet Metal Distributors' twenty-seventh annual meeting at Cleveland, May 16-17.

A definite movement to recognize the value of the distributor was evident in the papers and discussions. Sentiment in general reflected a feeling that improvement in business conditions is just ahead and the long view promises return of an active and profitable market. Legislation involving industry is becoming better understood, its application clarified, and a somewhat more liberal attitude on the part of government is seen.

Speaking on recent price legislation and its effect on distribution H. H. Maynard, professor of marketing and chairman, department of business organization, Ohio State university, Columbus, cited various cases in which complaints had been made against business practices deemed unfair. In many instances the fact was established that the practices complained of were justified by business conditions.

The federal trade commission, he said, is obtaining a body of opinion on the provisions of the Robinson-Patman law which will form a guide for future procedure. In one case a mail order house was cited as receiving a large discount in comparison with other customers but analysis of selling cost established that the discount might have been almost twice as large and still have been just. Thus discounts to large buyers may be justified by the record, he declared. A feature of this procedure, however, is the high cost of defending these charges.

Mr. Maynard defined the distributor who should receive a functional discount as one who renders a complete service, including storage close to the fabricators, acting as purchasing agent for the consumer and anticipating his needs, credit assistance; maintenance of a sales organization and supplying merchandising advice. The functional discount should be sufficient to cover the cost of these services.

He urged distributors to analyze their cost of obtaining orders to determine which classes of customers were most profitable and what lines of goods yielded best results. With such information the jobber can plan his selling more intelligently.

Refers to Wheeler-Lea Law

He referred to the Wheeler-Lea law, which empowers the federal trade commission to institute proceedings without a complaint being filed and also to issue a desist order without proof that a competitor is injured, if the public interest suffers. Under these additional powers the commission can act within wide limits in investigating what it may regard as unfair practice.

In discussion of the Miller-Tydings law and state fair practice laws, which are in force in 43 states, it was developed that the manufacturer is able to brand his goods and enforce a minimum selling price. This is in effect in some branches of trade but has not been used in the steel industry, although the manufacturer of roofing and other products can avail himself of this law to preserve his market. The sentiment expressed by numerous speakers was that the situation would be cleared if manufacturers would take advantage of this, establish minimum prices and then allow a distributors' discount sufficient to

Strip Steel Coilers Fascinate Mill Visitors

■ **Steam from water doused on hot steel spinning around a mandrel down in a pit makes it difficult to obtain a really good photograph of a strip mill coiler in action. Here delegates to the triple mill supply convention in Pittsburgh, May 9-11, are viewing a coiler at Jones & Laughlin Steel Corp.'s new mill. The strip, up to 91½ inches wide, speeds along the runout table at 1037 to 2074 feet per minute, is deflected by an apron into the coiler, mandrel of which is synchronized with the runout table rollers. Inside diameter of coils, 24 inches; maximum outside, 44 inches**

cover cost of distribution and a fair profit. A committee is to be appointed by the association to confer with representatives of steelmakers to work out a plan to this end.

John H. VanDeventer, editor, *Iron Age,* New York, assured the convention that the best days of the sheet metal industry are in the future. He called attention to the increase in flat-rolled steel production from 3,500,000 tons in 1905 to 17,000,000 tons in 1937. Wide adaptability of sheet steel is the reason for this increased tonnage, when compared to single-purpose steel like rails and structurals.

He stated that about $500,000,000 has been invested in continuous mills to produce sheets and strip and price reductions effected by improved methods have given consumers of these products savings of $575,000,000 a year, based on 1937 tonnage.

Argument for Modernization

"If there is available a more potent and effective argument as to the public value of an interest in modernization and improvement in production processes, I do not know where you will find it," he said. He predicted public opinion now forming will put an end to present tendencies in taxation and restraint of business, bringing a better era for capital and labor, for the steel industry and the flat-rolled steel business.

Bruce Wilson, of the federal housing administration, Washington, outlined the work of that body, which started in 1934 as an agency to provide modernization credits, the next year expanded to insure mortgage loans, and now has undertaken insurance of large scale housing loans. In some $570,000,000 in loans by this body losses have been only 1.2 per cent. The trend is toward purchase of household equipment, refrigerators, radios, air conditioning, stoves and steel furniture. He suggested a foundation to study the problem of home building for all industry and to discover the needs of housing, particularly in the low price brackets, which can provide an immense outlet for sheet steel. The desire for buying homes will supersede that for other things, he said, if price can be brought within the ability of those with incomes from $1000 to $2500 per year.

Some distributors stated they had obtained a good volume of business through this method of financing modernization, covering all the products they handle. In some instances over 50 per cent of materials needed came from their stocks. In the experience of several this class of business is the only one showing an increase this year over last.

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and president, National Manufacturers' association, related efforts which have been and are being made to give constructive suggestions to the government to aid business. His statements were similar to those he made in an address before the American Foundrymen's association in convention. (See p. 15.)

Joseph J. Lockwood, vice president, American Brass Co., Ansonia, Conn., outlined the situation in sheet copper. He predicted good profits for distributors who watch the market closely.

Discussion of the report on prepared roofing brought up the subject of jobber discounts. The distributors opposed granting the same discount to retailers as to distributors, since retailers can sell at a lower price than customers of the jobbers. It was suggested that a reclassification of jobbers be undertaken and manufacturers be urged to adhere to such a classification as a protection to their markets.

All officers were re-elected. Following adjournment members visited Republic Steel Corp.'s new 98-inch continuous strip mill in Cleveland.

LABOR

EMPLOYMENT RISES WITH TECHNOLOGICAL PROGRESS

■ TOTAL employment in the steel industry, instead of declining as a result of the large-scale adoption of continuous rolling mills and other technological advances in mill equipment, actually increased in that period of intensive mechanical progress, according to the American Iron and Steel institute.

Between 1926 and 1937 employment in four leading steel companies operating continuous mills for all or part of the period increased 28 per cent—a greater gain than that for the steel industry as a whole, employment in which rose 23 per cent over the period.

The number employed in sheet steel producing companies which do not have continuous mills during 1937 was 25 per cent greater than the number employed in the same companies in 1926.

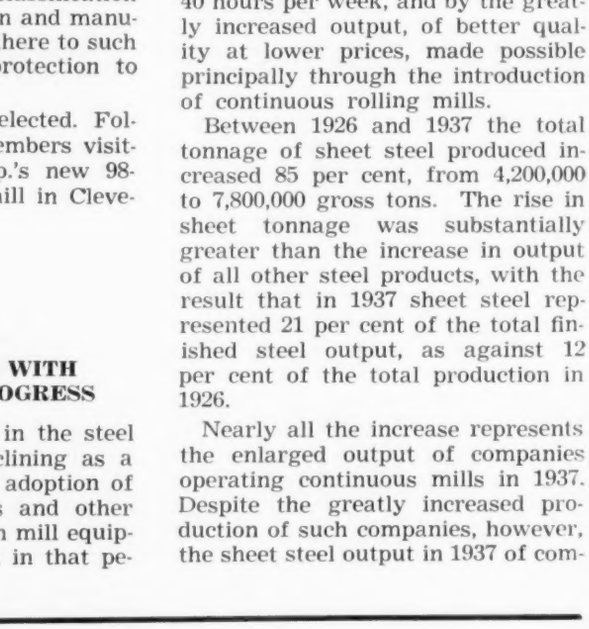
The sharp increase between 1926 and 1937 in the number employed in sheet producing companies, including both those operating continuous mills and those not so equipped, was brought about both by a reduction in working hours from 54 to less than 40 hours per week, and by the greatly increased output, of better quality at lower prices, made possible principally through the introduction of continuous rolling mills.

Between 1926 and 1937 the total tonnage of sheet steel produced increased 85 per cent, from 4,200,000 to 7,800,000 gross tons. The rise in sheet tonnage was substantially greater than the increase in output of all other steel products, with the result that in 1937 sheet steel represented 21 per cent of the total finished steel output, as against 12 per cent of the total production in 1926.

Nearly all the increase represents the enlarged output of companies operating continuous mills in 1937. Despite the greatly increased production of such companies, however, the sheet steel output in 1937 of com-

Relief Costs and Production at Peak in Same Year

■ Federal relief costs since the fiscal year 1932-33 have increased materially despite a rise in industrial production and a parallel drop in unemployment according to this graphic comparison by the National Industrial Conference board. The year 1936-37 registered the peak of recovery in production and lowest point in unemployment in five years, yet relief expenditures in the same year reached an all-time high.



panies which do not have continuous mills was close to the output in 1926, amounting to 846,000 tons compared with production of 935,000 tons in the earlier year.

The figures indicate that the greatly increased production of sheet steel in recent years is going principally into the fabrication of products which either were not important outlets for sheets before the continuous mill was developed, or could not be fabricated from the quality of sheets formerly available.

LABOR BOARD LOSES IN IGNORING CONTRACT

Union employes who strike in violation of a contract requiring arbitration of disputes cannot regain their jobs through an order from the national labor relations board, according to a ruling in the United States circuit court of appeals on an appeal by the Columbia Enameling & Stamping Co., Terre Haute, Ind. The company was directed by the board to re-employ 250 men who went on strike March 22, 1935. The court set aside the order on the ground that the employes failed to abide by their contract.

REPUBLIC COUNSEL TO ARGUE CASE BEFORE SUPREME COURT

Republic Steel Corp. counsel will appear before the United States Supreme Court May 23 to argue in favor of the ruling of the circuit court at Philadelphia that the national labor relations board should not be permitted to withdraw or amend its order against the company. (STEEL, May 9, p. 24).

The Supreme Court last week decided it would hear arguments on the labor board's appeal from the circuit court ruling and granted Republic's application to be heard on its own behalf. (See also P. 33.)

Honor D. A. Keating, 50 Years With Stanley Works

■ Daniel A. Keating, chief engineer, the Stanley Works, American Tube & Stamping plant, Bridgeport, Conn., completed 50 years continuous service with that organization May 11.

More than 250 company officials, mill associates, steel executives and municipal leaders attended a golden jubilee dinner in his honor. He was presented a gold 50-year service pin, a bound volume of 500 congratulatory letters from steel and mill equipment firms, and other gifts. John F. Conners, works manager, was chairman of the anniversary dinner.

Mr. Keating, a native of England, had little formal education. Starting as a machinist's apprentice at 19, he became chief engineer in 1919. He has been prominent as a designer and in research, in developing new uses for steel and refinements in its manufacture.

Products to which he contributed materially include the steel clock bell, first sparklet shells for carbonated gases, seamless door knobs, steel napkin holders, metal trimmings for signal towers, steel trimming for stoves, steel ball bearings for bicycles, first clincher rims made in America, baby carriage wheels, paper towel cabinets, billiard table tubes, rubber tire rims for carriages and coaches, window slides for cabs and many others.

Oliver Iron & Steel Marks 75th Anniversary

■ Oliver Iron & Steel Corp., Pittsburgh, last week observed its seventy-fifth anniversary. Founded in 1863 by Henry William Oliver with $15,000 capital, the company developed into one of the leading manufacturers of bolts, nuts, rivets, washers, forgings, pole line hardware and other products.

From its plant on Pittsburgh's south side have emerged some leading steel executives, including T. M. Girdler, chairman, Republic Steel Corp.; E. T. Weir, chairman, National Steel Corp.; and James A. Farrell, retired president, United States Steel Corp. Harry S. Devens is chairman, and Theodore F. Smith is president.

World Tin Statistics Issued by Council

■ Tin Research and Development council, 149 Broadway, New York, has issued the 1938 edition of its statistical yearbook, through its statistical office at The Hague. It presents description of tin mining in all parts of the world from the beginning of the industry to the present and a record in figures of the international tin control plan.

A new feature is a chart in the form of a genealogical table, tracing tin from the smelter through all the processes to the numerous applications in which it is finally used. It includes statistics of all the industries consuming tin.

Predict Early Passage of Wage-Hour Bill by House

■ Majority house leaders last week predicted passage of the house wages and hours bill without amendment by this mid-week. The bill was to come before the house Monday.

The senate, it is generally believed, will insist on a differential which is not contained in the house bill.

"Men Wanted" In Six Months, If—

■ "MEN WANTED" signs again would hang on factory gates if the national administration would allow business "to become self-generating," declared Ernest T. Weir, chairman, National Steel Corp. in an address before the West Virginia chamber of commerce at Charleston last week.

Mr. Weir predicted recovery would start in four to six months if the administration would change its policies to aid and encourage private enterprise. Pressure from congress and the people as a whole was indicated as the main hope for constructive action. The steel leader saw little chance for a voluntary "administration change of heart."

Specific proposals to aid business and speed recovery suggested:

"Restore confidence by an unqualified pledge to retain unaltered the principles and structure of the American systems of business and government.

"Declare a permanent policy with regard to basic economic controls.

"Amend tax laws to eliminate punitive and crippling provisions.

"Amend the labor laws so that they shall be fair and apply with equal force to the employer, all employes and all labor organizations.

"Remove the threats of government competition such as the one overhanging utilities.

"Send the Corcorans, the Cohens and their kind back where they came from. Cease attacks on business. Provide a leadership under which all the people can unite.

"Make this program clear and then stick to it."

Mr. Weir scored the spending and lending proposals in the President's message to congress last month.

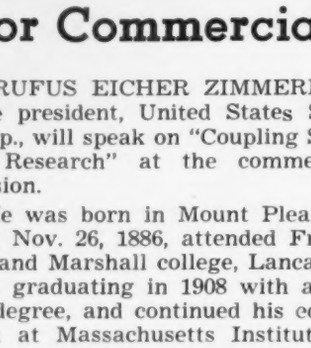
"President Roosevelt mentioned as the causes of the depression the fears of war, of nation-wide strike and of inflation. He did not name the most serious fear of all—the fear created by his own persistent refusal to take those steps which alone can produce healthy business activity. He pointed out that the government no longer has lands or other resources to give away and said that therefore the government must spend money . . .

"Mr. Roosevelt admits the billions he wants the government to spend will be only a drop in the bucket compared with normal private spending. But he expects those billions to act as a trigger which will set off an entire train of business activity and also bring the savings out of hiding. How hopeless! Those four billions in I.O.U.'s will have no more effect than fool's gold unless the administration allows business to become self-generating."

Contribute to Steel Institute Program For Commercial, Technical Sessions

■ RUFUS EICHER ZIMMERMAN vice president, United States Steel Corp., will speak on "Coupling Sales to Research" at the commercial session.

He was born in Mount Pleasant, Pa., Nov. 26, 1886, attended Franklin and Marshall college, Lancaster, Pa., graduating in 1908 with a Ph. B. degree, and continued his education at Massachusetts Institute of Technology, receiving his S. B. degree in 1911.



R. E. Zimmerman

He became instructor in physical chemistry at Massachusetts institute, and in 1914 joined the American Sheet & Tin Plate Co. in Pittsburgh as a research associate.

In 1915 he was appointed assistant director of the research laboratory of American Sheet & Tin Plate Co., and in 1917 acting director of research. He became director of research in 1919 and assistant to vice president in 1922, a position which he held until 1932. In that year he went to New York as assistant to the president of the United States Steel Corp., and in 1933 was made a vice president.

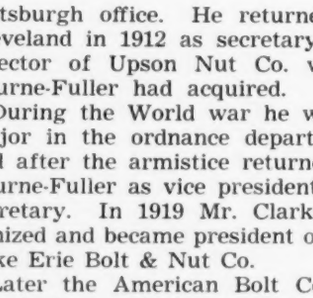
During the World war, Mr. Zimmerman was consulting chemical engineer for the United States bureau of mines. He is a member of many technical societies.

■ NORRIS J. CLARKE, vice president in charge of sales, Republic Steel Corp., Cleveland, will talk on "The Problem of the Small Order."

Mr. Clarke was born in Cleveland, Aug. 29, 1883, attended Cleveland grade and high schools. In 1896 he became an office boy for Bourne-Fuller Co., was promoted to clerk, then salesman and in 1905 was placed in charge of the company's Pittsburgh office. He returned to Cleveland in 1912 as secretary and director of Upson Nut Co. which Bourne-Fuller had acquired.

During the World war he was a major in the ordnance department and after the armistice returned to Bourne-Fuller as vice president and secretary. In 1919 Mr. Clarke organized and became president of the Lake Erie Bolt & Nut Co.

Later the American Bolt Co. of Birmingham, Ala., was taken over and on Dec. 1, 1929, Mr. Clarke's company was merged with the Foster Bolt & Nut Co. and the Lamson & Sessions Co. under the name of the latter concern, with Mr. Clarke as vice president. He became vice president in charge of sales for Republic Sept. 1, 1930.



N. J. Clarke

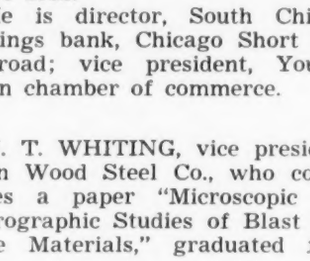
■ WILLIAM B. GILLIES, vice president in charge of operations, Youngstown Sheet & Tube Co., will speak on "Promoting Demand Through Improving Quality."

He was born in Chicago, Oct. 6, 1883, and was graduated from Cornell in 1904 with an M. E. degree.

Mr. Gillies was foreman, Illinois Steel Co., 1904-07; superintendent, bessemer department, South Works, 1907-13; superintendent, bessemer and rail mill, 1913-17; assistant general superintendent, Mark Mfg. Co., 1917-21; general superintendent, Steel & Tube Co. of America, 1921-23; district manager, Youngstown Sheet & Tube Co., Chicago district, 1923-29; assistant vice president of operations, 1929-33; vice president since 1933.

He is director, South Chicago Savings bank, Chicago Short Line railroad; vice president, Youngstown chamber of commerce.

■ J. T. WHITING, vice president, Alan Wood Steel Co., who contributes a paper "Microscopic and Petrographic Studies of Blast Furnace Materials," graduated from University of Michigan in June, 1909, as a mechanical engineer. In July, 1909, he went to work in the metallurgical department of Illinois Steel Co.'s South Works, South Chicago, Ill., going from there to the blast furnace department.



W. B. Gillies

He worked successively for the By-Product Coke Corp., South Chicago, which then was under the management of Semet-Solvay Co., Federal Furnace Co., South Chicago; Whitaker-Glessner Co., Portsmouth, O.; Steel & Tube Co. of America,

J. T. Whiting

(Following its usual custom, STEEL herewith prints brief biographical sketches of those who will present papers on technical or commercial subjects at the meeting of the American Iron and Steel institute, New York, May 26. For complete program of the meeting see STEEL, April 25, p. 18.)

Mayville, Wis., and Donner Steel Co., Buffalo.

In September, 1927, he became associated with the Hamilton Coke & Iron Co., Hamilton, O., as vice president and general manager. He was elected vice president of the Alan Wood company Jan. 1, 1932.

■ HAROLD K. WORK, who collaborates with H. W. Graham in a paper on "Effects of Variation in Pig Iron on Quality of Steel," is manager, research and development division of the general metallurgical department, Jones & Laughlin Steel Corp.

He was graduated from Columbia university in 1923 with bachelor of arts degree and in 1925 received his degree in chemical engineering. He then went to the Mellon Institute of Industrial Research, University of Pittsburgh, where in 1929 he was awarded a Ph. D. degree.

The same year he was employed in the research department of the Buffalo plant, Aluminum Co. of America, and in 1931 was made a division head of the Aluminum Research laboratories at New Kensington, Pa. In 1934 he was appointed chemical engineer of the jobbing division, which position he held until 1936 when he went to Jones & Laughlin in his present capacity.

He is a member of the American Society for Metals, the American Institute of Chemical Engineers, the American Society for Testing Materials, the American Institute of Mining and Metallurgical Engineers, the American Chemical society, the Electro-Chemical society and the American Electro-Platers society.

■ HJALMAR W. JOHNSON, superintendent, blast furnace department, Inland Steel Co., Chicago, will present a paper, "The Peripheral Distribution of Gases in the Blast Furnace."

He received his B. S. degree in mining engineering from University of Illinois in 1922, working during vacations at Joliet blast furnaces as stove tender, mechanic's helper and furnace practice man.

H. W. Johnson

After graduation he was employed at Illinois Steel Co.'s South Works, Chicago, first as apprentice, then blower, and general foreman in the blast furnace department. In 1929 he went to Inland Steel Co. as assistant superintendent of blast furnaces and became superintendent of blast furnaces in 1930.

In 1932 he received the J. E. Johnson Jr. award from A. I. M. E. and presented a paper at the February, 1933, meeting in New York on "The Effect of Variations in Coke Ash on Pig Iron Analyses."

H. K. Work

Mr. Johnson became president of Chicago district Blast Furnace and Coke association in 1937. He is a member of the blast furnace and raw materials committee of A. I. M. E.

R. S. McCaffery

■ HERBERT W. GRAHAM, who collaborates with H. K. Work in a paper on "Effects of Variation in Pig Iron on Quality of Steel," is general metallurgist of Jones & Laughlin Steel Corp.

H. W. Graham

He was graduated from Lehigh university in 1914 as a metallurgical engineer and since then has been associated continuously with Jones & Laughlin in various supervisional and technical capacities in steelworks operations and in metallurgical work. For the past ten years he has supervised all the company's technical affairs.

Mr. Graham has been active in several technical societies and is a member, American Iron and Steel institute, Society of Automotive Engineers, American Society for Metals, American Society for Testing Materials, American Society for the Advancement of Science, Iron and Steel institute (British), American Institute of Mining and Metallurgical Engineers, National Research council and Verein Deutscher Eisenhuettenleute.

■ RICHARD S. McCAFFERY, who will present a paper on "A Study of Blast Furnace Slags," is professor of mining and metallurgy at the University of Wisconsin. Born June 2, 1874, in New York, Professor McCaffery was graduated from Columbia university's school of mines in 1896 with an E. M. degree.

He has been superintendent of several copper companies in South America and in the United States and was general manager of Glamorgan Works, Lynchburg and Radford, Va. In addition to his professorship at Wisconsin, he also is a consulting metallurgist, and has invented improvements in bessemerizing steel.

Professor McCaffery is a member of Alpha Chi Sigma, Tau Beta Pi and Sigma Xi fraternities and many engineering societies, and is the author of various technical papers.

■ Electric Storage Battery Co., Philadelphia, manufacturer of Exide batteries, in June will observe its fiftieth anniversary in business.

MEN OF INDUSTRY

■ R. J. SCHULER, formerly general manager of sales, LaSalle Steel Co., Chicago, has joined the general sales organization of Republic Steel Corp. as general sales representative of the Union Drawn Steel division, Massillon, O. He served 13 years in sales capacities for LaSalle Steel Co. until his resignation last January. For the present Mr. Schuler will maintain headquarters in the Detroit offices.

♦

Ralph H. Sartor has resigned as commissioner, Metal Window institute, to become sales manager, Federal Steel Sash Co., Waukesha, Wis.

♦

J. R. McElveen has been appointed office manager of the Detroit district sales office of Carnegie-Illinois Steel Corp.

♦

Bennett Chapple, vice president, American Rolling Mill Co., Middletown, O., has returned to his duties after several months' convalescence in Florida.

♦

R. G. Falk has been elected president and treasurer, W. C. Hauck & Co., San Francisco. W. F. Postel is vice president, and H. J. Eames, secretary.

♦

E. F. Klick, Rochester, N. Y., has been appointed special sales engineer by Connecticut Blower Co., Hartford, Conn., to represent its products in New York state.

♦

J. F. Roche Jr., for the past three years manager, industrial division, Binks Mfg. Co., Chicago, has been appointed vice president and a member of the board of directors.

♦

Dr. Howard E. Fritz, for many years in charge of the chemical sales division, B. F. Goodrich Co., Akron, O., has been placed in charge of the newly-formed synthetic sales department.

♦

P. H. Nicholls has been appointed representative in the southeastern states for Struthers-Wells division of Struthers-Wells-Titusville Corp. His headquarters are at 1008 Norris building, Atlanta, Ga.

♦

Carl McFarlin has been elected vice president and general manager, Tennessee Products Corp., Nashville, Tenn. He formerly was president, Whitwell Smokeless Fuel Co., Chattanooga, Tenn., which properties and business have been acquired recently by the Tennessee corporation. Mr. McFarlin will be

R. J. Schuler

in charge of operations, sales and personnel.

♦

L. Strockstrom has been advanced from president to chairman of the board, American Stove Co., St. Louis, and his son Arthur, heretofore secretary and vice president, has been made president.

♦

Frank B. Jewett, vice president, American Telephone & Telegraph Co., and president, Bell Telephone Laboratories, received the Washington award for 1938 at a banquet participated in by various engineering societies at the Palmer House, Chicago, May 5.

♦

Ernest L. Nye has been elected a member of the executive committee and J. Homer Platten has been elected a vice president, Brill Corp., New York. Both are directors of the corporation.

♦

William Wiley Brooks has been appointed district sales manager in the Atlanta, Ga., territory for

W. W. Brooks

Wheeling Steel Corp., Wheeling, W. Va. For many years Mr. Brooks was identified with the John C. Vance Iron & Steel Co., Chattanooga, Tenn., in various sales and executive capacities. Mr. Brooks will maintain headquarters in the Healey building, Atlanta.

♦

A. S. Bonner, formerly secretary-treasurer, Clark Equipment Co., Buchanan, Mich., has been made executive vice president. L. L. Lyons has become treasurer, and G. E. Arnold, secretary.

♦

J. M. McKenzie, since 1922 purchasing agent, West Steel Casting Co., Cleveland, has resigned to become associated with the Cleveland Metal Abrasive Co., Cleveland, as treasurer in charge of sales and buying.

♦

F. B. DeLong, heretofore manager of tubular, alloy and stainless products, Columbia Steel Co., Los Angeles, subsidiary of United States Steel Corp., has been appointed manager of sales in that district. He succeeds A. G. Brown, resigned.

♦

J. N. Goodier has been named acting professor of mechanics in the Sibley school of mechanical engineering at Cornell university. He was research fellow in applied mechanics for the Ontario Research Foundation since 1931.

♦

Elijah B. Martindale has been elected president, VanCamp Hardware & Iron Co., Indianapolis. He succeeds his father, the late John T. Martindale. Mr. Martindale has been associated with the business 15 years, the past several as vice president.

♦

D. C. Jackling, president, American Institute of Mining and Metallurgical Engineers, and president and founder, Utah Copper Co., was the guest of honor at the annual president's day banquet of the Chicago section of the institute at the Blackstone hotel, Chicago, May 7.

♦

William S. Richardson, merchandising manager, mechanical goods division, B. F. Goodrich Co., Akron, O., has been named general sales manager of that division, succeeding the late C. E. Cook. L. H. Chenoweth, assistant merchandising manager since 1931, becomes merchandising manager.

♦

Walter F. Wright has been appointed vice president and general sales manager, Graham-Paige Motors Corp., Detroit. In the past eight years he has developed and patented a number of accessory items for automobile use, and prior to that was active in automotive sales work

in Cleveland for Willys-Overland and Chrysler.

♦

Robert L. Pierce has been appointed district sales representative in Kansas City, Mo., for Jones & Laughlin Steel Corp., with headquarters at 950 Dierks building. A graduate of the University of Michigan, Mr. Pierce was formerly associated with another independent steel manufacturer as sales representative at Kansas City, Youngstown and Philadelphia.

♦

William H. Plage, associated with the Crucible Steel Co. of America, New York, and its predecessors for 46 years, has retired. He served in the capacities of salesman, assistant manager and manager of the New York office and for the last six years has been acting as special sales agent.

♦

Walter M. Nones has been re-elected president, Norma-Hoffman Bearings Corp., Stamford, Conn., and Odbert P. Wilson has been elected executive vice president and treasurer. In his new position, Mr. Wilson, who has been associated with the company 24 years, assumes the executive duties and responsibilities which Mr. Nones has carried for 27 years. Harold J. Ritter has been re-elected secretary.

♦

H. R. Jesson has been returned to the post of president and general manager, Vento Steel Products Co., Muskegon, Mich., succeeding the late J. M. Mercer. Mr. Jesson had served as president from 1935 to 1938, during which time Mr. Mercer was vice president and general manager, but early this year Mr. Mercer was made president and general manager, and Mr. Jesson was elected treasurer. Mr. Jesson will continue his duties as treasurer.

♦

Frank F. Wise has been transferred from the engineering and construction division of Koppers Co., Pittsburgh, with which he has been associated since he was graduated from Carnegie Institute of Technology in 1916, to the company's western gas division at Fort Wayne, Ind., as general manager. R. A. Wickes has become sales manager of the western gas division, and A. G. Hall will remain as works manager.

♦

C. F. Newpher, general sales manager, National Screw & Mfg. Co., Cleveland, has appointed the following as assistant managers of sales: B. H. Jones, in charge of general sales office, quotations, orders, and pricing; Charles W. Baker, in charge of development of new products, research, sales engineering, sales records and complaints; Harold W. LaGanke, in charge of certain accounts and special assignments. Some of the Cleveland territory formerly handled by Mr. LaGanke will be handled by George R. Ingersoll Jr.

♦

John W. Humphrey, heretofore order clerk, Irvin works, Carnegie-Illinois Steel Corp., has been made superintendent of production and shipping at Irvin works. He succeeds the late H. C. Ford. Lewis E. Johns, who joined Carnegie-Illinois April 1, has been appointed assistant chief of service bureaus.

♦

Ralph E. Rowley has retired as chief civil engineer, Gary works,

Ralph E. Rowley

Carnegie-Illinois Steel Corp., due to illness. Associated with the corporation nearly 49 years, Mr. Rowley directed all civil engineering in erection of the Gary mills.

♦

C. F. Straney, Albany Steel & Iron Supply Co. Inc., Albany, N. Y., has been elected president, Purchasing Agents Association of Eastern New York. Other officers are: vice president, George L. Brown, F. C. Huyck & Sons Inc., Rensselaer, N. Y.; treasurer, S. C. Main, National Bank & Trust Co., Albany; secretary, A. K. Munson, United Traction Co., Albany; national director, J. L. Hodgkins, H. B. Kimmey Co., Albany. Executive committee includes James Elder, Cluett-Peabody Co., Troy, N. Y.; A. Wilbur Mace, Ludlum Steel Co., Watervliet, N. Y.; L. R. Perlee, Havens Electric Co., Albany.

♦

Eight representatives of the Carborundum Co., Niagara Falls, N. Y., in the Pittsburgh area were made members of the Ten Year club at a meeting in Pittsburgh recently. They are J. C. Gallen, F. S. Lee, A. W. Smith, W. A. Rohaly, L. L. Marra, F. H. Appenrodt, E. W. Leathers and F. R. Sherwin. Twenty-six representatives of the company were present at the induction ceremonies in Hotel Fort Pitt, including Charles Knupfer, S. F. Courter, F. J. Tone Jr., George Dresser and F. H. Manley Jr., all of Niagara Falls. The club, composed of men who have served the company ten years or more, has more than 1300 members throughout the country.

DIED:

■ JAMES M. MERCER, 47, president and general manager, Vento Steel Products Co., Muskegon, Mich., in that city, May 9. He joined the company in 1932 as sales manager; in 1934 became vice president and general manager, and last January was made president and general manager.

♦

Louis Hager, 64, vice president, C. Hager & Sons Hinge Mfg. Co., St. Louis, in St. Louis, May 3.

♦

Joseph S. Adkins, 49, owner of Adkins Machine Co., Columbus, Ind., in Columbus, recently.

♦

William M. Maerkle, 66, secretary-treasurer, Pioneer Machine & Engine Co., Cleveland, May 1.

♦

Dr. Anatoli C. Seletzky, 33, associate professor of electrical engineering, Case School of Applied Science, Cleveland, in Cleveland, May 11.

♦

Davisson A. Benson, 59, at his home in Frostburg, Md. Mr. Benson was the organizer in 1902 of the Big Savage Fire Brick Co., Frostburg.

♦

James H. Lockhart, 74, director and vice president, Lockhart Iron & Steel Co., Pittsburgh, and also a director, United Engineering & Foundry Co., in Pittsburgh, May 16.

♦

Frank E. Droese, 40, assistant chief chemist for the past two years, Corrigan-McKinney works of Republic Steel Corp., in Cleveland, May 15.

♦

Arthur Bronson, 70, formerly assistant sales manager in Milwaukee for Carnegie-Illinois Steel Corp., in Milwaukee, May 13. He had been associated with subsidiaries of United States Steel Corp. since 1905. He retired May 1.

♦

Leon DeLargey, purchaser of steel for the Eaton Mfg. Co., Cleveland, in Cleveland, May 19. For 23 years he had been purchasing agent for the Eaton company and its predecessors. He was a member, National Association of Purchasing Agents.

♦

Joseph B. Strauss, 68, designer of the Golden Gate bridge, San Francisco, in Los Angeles, May 16. Starting his career as a draftsman, Mr. Strauss joined the Lassig Bridge & Iron Co., Chicago, and later headed his own firm. He moved to the Pacific coast in 1929 to become chief engineer of the Golden Gate bridge.

Allegheny-Ludlum Merger Details

■ PROPOSAL to merge the Allegheny Steel Co., Brackenridge, Pa., and Ludlum Steel Co., Watervliet, N. Y., to round out their manufacturing facilities will be submitted to stockholders of both companies Aug. 10. The two boards of directors approved the plan last week.

If ratified, the company will be called the Allegheny Ludlum Steel Corp. Its board of directors will be drawn from the boards of the present companies approximately in proportion to their respective assets.

Stockholders in Ludlum and Allegheny will be entitled to the same number of shares as are now held in either or both companies.

Chief advantage of the consolidation, according to the following joint statement by the boards, will be to effect economies by complementing each other's present facilities:

"Each company is now in need of additional facilities which the other can supply. For example, Allegheny requires additional bar rolling equipment and Ludlum requires flat rolling facilities. The combined companies will have sufficient equipment for rolling both bars and flat products without additional investment and will be more nearly self-contained because of the complementing facilities.

"For this reason the merged companies should be able to provide increased and more steady employment than has been the case when operating individually and by the same token should make more efficient use of rolling and other facilities, thereby lowering operating costs and making available to the public a larger volume of the better steels.

Complete Range Covered

"No two companies in the industry so completely represent, with scarcely any duplication of importance, the complete range of alloy steel products as do these two companies. From corrosion-resisting wire as fine as 0.003-inch in diameter, Ludlum's products range through the heat, corrosion, wear, and shock-resisting fields, including alloy forgings and castings, up to bars 6 inches in diameter, as well as slabs and billets.

"Where Ludlum leaves off with nine bar mills, 14 forging hammers, and those heat-treating and processing facilities so essential to its type of products, Allegheny provides over 400,000 tons of melting capacity and modern finishing equipment for the production of flat-rolled products from narrow strip up to wide sheets and plates, and provides in addition facilities for manufacture of substantial tonnages of tubular products, both lapweld and seamless, and iron and steel castings.

"Approximately 40 per cent of Allegheny's 400,000 tons of melting capacity is devoted to Allegheny's special quality silicon steels and to the stainless alloys.

"This is noteworthy because in view of the present relatively small volume of high quality flat-rolled steel products it is desirable that additional production of the so-called ordinary steels be available to carry the overhead of the expensive manufacturing equipment required for quality production. To this end the electric steel capacity of the two companies, amounting to about 138,000 tons, would be supplemented by Allegheny's 300,000 tons of flat-rolled soft steel capacity."

Finances Well Balanced

Assets of the two companies total $31,815,060 and property value $17,790,519. Current assets are $13,218,516 and current liabilities are $3,186,506, leaving working capital of $10,032,010.

In 1937, Ludlum's gross sales amounted to $12,997,044, compared with $36,573,419 for Allegheny. Ludlum's manufacturing profit, $4,323,397, compared with $4,461,952 for Allegheny.

Ludlum's net profit from operations $1,389,549; Allegheny's $2,237,759. Net earnings before dividends were $1,120,422 for Ludlum and $1,813,707 for Allegheny.

Earnings per common share were $2.24 for Ludlum and $2.10 for Allegheny. Allegheny has 33,426 shares of 7 per cent cumulative preferred stock outstanding and 753,985 shares of common. Ludlum has 500,000 common shares, no preferred stock.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended May 21	Change	Same week 1937	Same week 1936
Pittsburgh	30	+ 5	96	61
Chicago	29	— 2.5	85	70.5
Eastern Pa.	27	None	73.5	43
Youngstown	26	— 1	80	76
Wheeling	38	None	94	89
Cleveland	23	None	82	74
Buffalo	25.5	— 2.5	88	78
Birmingham	63	— 3	83	69
New England	30	None	100	75
Cincinnati	45	+20	90	80
St. Louis	33.3	None	94	†
Detroit	18	None	99	88
Average	30	None	91.5	66.5

†Not reported.

Visit Worth Steel Plant

■ Worth Steel Co., Claymont, Del., was host to the Philadelphia section, American Welding Society, last Wednesday. About 100 members attended. They visited all departments of the mill, open hearth, plate, sheet and flanging.

PRODUCTION

■ AN INCREASE of 5 points in the Pittsburgh district rate was offset by declines at a few other points and the national steelworks operating rate last week was unchanged at 30 per cent.

Pittsburgh — Increase in schedules by large producers advanced the rate 5 points to 30 per cent.

Wheeling — Unchanged at 38 per cent.

Chicago — Declined 2.5 points to 29 per cent, the lowest in ten weeks. Blast furnace schedules are unchanged.

Central eastern seaboard — Irregularity of operations held the rate at 27 per cent. One company added a furnace, which balanced a decline by another.

Birmingham, Ala. — Loss of one open hearth, partly offset by addition of a smaller unit, reduced the rate 3 points to 63 per cent, after holding steadily at 66 per cent since the last week of March.

St. Louis — Steady at 33.3 per cent, with no change indicated for this week.

Detroit — Continued at 18 per cent for the eighth consecutive week.

Cincinnati — Staggered schedule brought production last week to 45 per cent, a rise of 20 points. A lower rate will be in effect this week.

New England — For the third week operations held at 30 per cent, with schedules the same for this week.

Cleveland — No change from 23 per cent, which is expected to continue this week.

Buffalo — Dropping of one open hearth brought a decline of 2.5 points, to 25.5 per cent.

Youngstown — One open hearth and a bessemer unit were taken off, causing a loss of 1 point to 26 per cent. Production this week is expected to be at 22 per cent as Youngstown Sheet & Tube Co. suspends three open hearths at its Brier Hill plant.

Auto Production Lower

■ Automobile production continues to taper, last week's output of 46,810 units being 605 under the week before and a new low for the 1938 model season. Comparisons, according to *Ward's Reports*:

	Week ended May 21	Week ended May 14
General Motors	18,550	20,200
Chrysler	8,550	9,850
Ford	14,885	12,385
All others	4,825	4,980

Monthly and yearly comparisons will be found on page 30.

Activities of Steel Users, Makers

■ WYCKOFF Drawn Steel Co., with plants at Ambridge, Pa., and Chicago, announces it is prepared to supply the newly developed Lead-Loy steel in all popular SAE analyses. This new product, which is made by the addition of small quantities of lead to the ladle after tapping the open hearth, was described in STEEL, May 16, page 29. It was developed by Inland Steel Co., Chicago.

♦

Simplex Oil Heating Corp., New York, has moved from 30 Church street to 21 West street.

♦

Rustless Iron & Steel Corp. has moved its Chicago office from 4013 Milwaukee avenue, to 4201 Irving Park road.

♦

Keystone Engineering Co., Pittsburgh, is now located at 909 Bessemer building, Sixth street and Duquesne way.

♦

Heatbath Corp., Springfield, Mass., has moved to larger quarters at the foot of Oak street, Indian Orchard, a suburb of Springfield.

♦

American Society of Tool Engineers Inc., Detroit, has moved from 5928 Second boulevard, to room 428, Boulevard Temple building, 2567 West Grand boulevard.

♦

Harnischfeger Corp., Milwaukee, which recently booked a $500,000 order for steel houses from John H. McClatchy, Philadelphia real estate operator, has taken contract to supply Keys & Entrees, Rochester, N. Y., with complete material for 20 dwellings.

♦

Reliance Electric & Engineering Co., Cleveland, has moved its New York office to 110 East Forty-second street; the Pittsburgh office to 355 Fifth avenue.

♦

Cleveland Tungsten Mfg. Co. held "open house" and demonstrated processes at its new plant, 10200 Meech avenue, Cleveland, recently. E. O. Oberdick, president, explained that the plant is equipped to manufacture tungsten metal by both hydrogen and carbon reduction processes.

♦

Union Metal Mfg. Co., Canton, O., recently purchased the Burton Mfg. Co., Michigan City, Ind., manufacturer of seamless steel structural tubing. The entire stock and equipment has been transferred to Canton. E. B. Rogers, president of the Burton company, and formerly superintendent of Mid-West Forging Co., Chicago, is now associated with Union Metal, in charge of tubing operations.

♦

Northwestern Barb Wire Co., Sterling, Ill., has changed its name to Northwestern Steel & Wire Co., to more clearly express the scope of its business. Established in 1879 the company for many years fabricated wire products, but with the addition of a new steel plant in 1935, it now makes electric steel billets, rods, bars, bands, angles, shapes, fencing, nails, netting, bale ties, hardware cloth and related items.

♦

Stainless Metals Inc., New York, fabricator of stainless steel and monel metal kitchen equipment for hotels and restaurants, has established additional manufacturing facilities at 31-49 Twelfth street, Long Island City. About 30,000 square feet of floor space has been provided and equipment installed. The company is bringing out a new line including pails, batch cans, dippers, scoops, etc. It will have its headquarters at the Long Island City address.

Steel Grommet for Life Guards Woven by Hand

■ **This endless rope, known as a grommet, was made by Bethlehem Steel Co., Williamsport, Pa., for S. M. Christhilf & Co., Baltimore and will be used by the Coast Guard. It is of high-strength, 1⅜-inch wire rope, capable of lifting 80 tons and was woven by hand. One continuous length of strand was wound helically six successive times around the entire 105-foot circumference**

MEETINGS

May 22-26—National Electrical Wholesalers' association. Thirtieth annual convention at the Homestead, Hot Springs, Va. E. Donald Tolles, 165 Broadway, is managing director.

June 5-10—National Association of Credit Men. Forty-third annual meeting at St. Francis hotel, San Francisco. Brace Bennitt, 1 Park avenue, New York, is convention director.

June 12-17—Society of Automotive Engineers. Summer meeting at the Greenbrier, White Sulphur Springs, W. Va. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary.

June 13-15—American Electro-Platers' association. Twenty-sixth annual convention at Schroeder hotel, Milwaukee. W. J. R. Kennedy, 90 Maynard street, Springfield, Mass., is executive secretary.

June 13-15—National Warm Air Heating and Air Conditioning association. Mid-year convention at Schroeder hotel, Milwaukee. Allen W. Williams, 50 West Broad street, Columbus, O., is managing director.

June 14-17—Institute of British Foundrymen. Thirty-fifth annual conference at Technical college, Bradford, Yorkshire. T. Makemson, St. John Street Chambers, Deansgate, Manchester, England, is secretary.

June 16-17—Stoker Manufacturers' association. Annual meeting at the Homestead, Hot Springs, Va. Marc G. Bluth, 307 North Michigan avenue, Chicago, is secretary.

June 20-22—American Society of Heating and Ventilating Engineers. Summer meeting at the Homestead, Hot Springs, Va. A. V. Hutchinson, 51 Madison avenue, New York, is secretary.

June 20-23—National Association of Cost Accountants. Nineteenth annual meeting at Palmer House, Chicago. Stuart C. McLeod, 385 Madison avenue, New York, is secretary.

June 20-24—American Society of Mechanical Engineers. Semiannual meeting at Statler hotel, St. Louis. C. E. Davies 29 West Thirty-ninth street, New York, is secretary.

June 20-24—American Institute of Electrical Engineers. Summer meeting at Mayflower hotel, Washington. H. H. Henline, 33 West Thirty-ninth street, New York, is secretary.

June 27-July 1—American Society for Testing Materials. Forty-first annual meeting at Chalfonte-Haddon hall, Atlantic City, N. J. C. L. Warwick, 260 South Broad street, Philadelphia, is secretary.

June 27-30—American Society of Agricultural Engineers. Annual meeting at Asilomar hotel, Pacific Grove, Calif. Raymond Olney, St. Joseph, Mich., is secretary.

GEARMOTOR STEPS UP THE SPEED OF THIS SHEAR

NOW PRODUCES 50 TO 100 MORE FEET PER MINUTE

Power transmitted direct to the shaft through a Westinghouse gearmotor increased production from this flying shear.

Used for cutting plate from strip, the shear was formerly operated by a conventional type drive. The belt had to be tightened to prevent slippage during starting, then the tension relieved when the shear was up to speed.

The gearmotor by eliminating these adjustments made it possible to operate the shear at a speed of 350 to 400 feet per minute—50 to 100 feet faster per minute than the former installation.

The chances are 4 to 1 that gearmotors will save in your power applications. Consult Westinghouse—not only leaders in the development of the electric motor, but makers of precision gears for over 50 years. Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pennsylvania.

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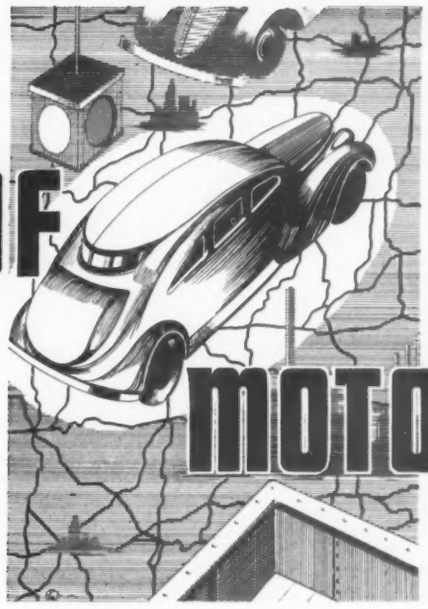

DETROIT

■ CHANCES of labor discord arising in local tool and die shops just as new model business is approaching a peak, considered likely by many in view of the expiration of the industry's contract with the UAW, have been minimized with the signing of a new contract covering UAW members in 23 of the larger shops. Agreement was reached following weeks of bickering and the new terms are substantially unchanged from the contract which expired May 1.

Wage rates are continued unchanged. During periods of layoffs the agreement provides first for the layoff of temporary employes, and then alternating remaining men on a 32-hour week basis, so as to split the work among the greatest number of men. Exceptions to the latter provisions involve "leaders," and cases where a job cannot be worked reasonably under this arrangement.

Overtime work (beyond 40 hours weekly), is paid on the basis of time-and-a-half for Saturdays and double time on Sundays and holidays. Second and third shifts receive 5 cents an hour additional compensation.

Pact To End in Off Season

Of special significance is the provision in the agreement calling for termination Jan. 1, 1940, with any subsequent changes to be proposed within 60 days prior to Jan. 1, 1939. This will prevent recurrence of the difficulty encountered this year when the agreement expired in the midst of normally a busy season.

Undoubtedly some tool and die business has been postponed or placed out of town because of fear strikes might develop in local shops. With termination of contract now coming in January, smooth sailing can be expected laborwise during the spring and summer months.

The long delay in arriving at details of the new contract is said to have been caused by early exorbitant demands by the UAW, including wage increases, sole bargaining privileges, changes in seniority provisions, etc., none of which was granted. It appeared the UAW suddenly backed down completely on its demands and was content to renew existing provisions.

Tool and die shops, currently operating at about 60 per cent of capacity, expect an influx of new business soon, as decisions are reached on final phases of 1939 models. A considerable amount of Chrysler work still is to be awarded, and probably will be placed with local shops principally.

Just when the first editions of next year's models will appear is a matter of considerable speculation. Buick probably will be the first of the General Motors units to come off the line, since the Buick plant supplies parts for several other GM lines. One good guess is that Buick will be ready by Sept. 15, with Pontiac, Olds, Chevrolet and Cadillac following some time after Oct. 1.

Every effort is being made to avoid last-minute rushes in putting finishing touches on show models. Last year, for example, a good many jobs in the New York show repre-

BY A. H. ALLEN
Detroit Editor, STEEL

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Ford Introduces Cab-Over-Engine Truck

■ **Easy maneuverability is a feature of Ford Motor Co.'s new cab-over-engine truck as its short wheelbase, 101 inches, facilitates working in close quarters. Capacity is 1½ tons. A cab-over-engine truck also is built with 134-inch wheelbase**

sented an enormous investment in hand work, necessitated by the fact assembly lines had not started rolling.

This year the word is out to avoid all hand work on first models, with its attendant high cost, and to have assembly lines ready to produce whatever models are needed for shows and key dealers. Hence some suppliers are already feeling the pressure to get out parts for 1939 lines, even though their introduction is five months away.

This is probably the last year new model activity will be under way so early, since in all likelihood their introduction will be deferred until the first of the year once more. It was attempted originally to schedule the New York show in December, but the facilities were not available at that time, so the show was scheduled in November, but 1940 models will not appear before Jan. 1, 1940, thus putting retooling programs back into the late summer and early fall periods where they once were.

■ MACHINE TOOL business locally is slow with the exception of a large amount of foreign business, principally for Italy, Russia and Japan. Foreign business is accounting for 75-90 per cent of the total business of some local builders. An eastern machine tool builder, through its district office here, reports its plant operating 45 hours per week with about 3000 men, 65 per cent of this activity being accounted for by foreign purchases.

Canadian industry, including several shops in nearby Windsor, is expected to speed up appreciably in the next 30 days when the full effect of British and Canadian armament programs is felt. Juicy airplane contracts are counted to give an important fillip to forge shops and other metalworking interests. Industries in the Dominion already have been aided by the increase in Canadian automotive industry, but the paralysis in automobile buying in this country has spread to some extent across the border.

Speaking of paralysis, some form of this malady is spreading throughout the Ford organization, as far as its far-flung construction program is concerned. Holdups and cancellations have been issued on nearly everything involved in the Rouge plant expansion.

Perhaps Mr. Ford sees himself being ground between the two millstones of "organized finance" and a dictatorial government, to the end that he is being forced to hold a close rein on all resources in the current storm.

Between holdups and cancellations of new equipment in process, suppliers are in a dither over just what the outcome will be. It is virtually impossible to get any positive statement of future plans from the Rouge plant; meantime all that can be done is to mark time and await developments. Ford has never been one to leave suppliers holding the bag, and there is no reason to believe such a course will be pursued in the present instance.

Pruning forks continue to be wielded throughout executive and administrative organizations in the automobile industry. Hard and fast rules are being issued to guarantee rigid economy. In some cases, even over-night trips are being ruled out, and instructions issued to do such work in one day or not at all. Dodge has laid off several thousand in the past two weeks, and reports are being circulated that a two-month shutdown is in prospect.

Willys in Toledo, O., has closed its plant for two weeks, this decision being touched off by an attempted dues drive on employes about ten days ago. Men going to work were being stopped by UAW leaders and before the situation could become critical, the plant was closed. Lack of orders naturally had much to do with the closing.

In an interview, Dave R. Wilson, president of Willys, declared apprehension on the part of dealers and distributors over business conditions was the main stumbling block in the way of moving new cars. He scoffed at possibilities of any ultra-small cars such as mentioned here May 9 meeting with success. He maintained it impossible to build such a car to sell for $250.

Continuation of efforts to build up the Willys organization is seen in the appointment of Floyd F. Kishline as assistant chief engineer. The latter has been chief engineer for Graham and is chairman of the Detroit section of S.A.E. Simultaneously the resignation of N. A. Beardsley as general sales manager of Willys has been announced. His post likely will be absorbed by W. C. Cowling, former Ford sales head, who was taken into the Willys organization as a vice president some months ago. The Cowling-Roos-Kishline combination of sales and engineering brains should be an important influence in Willys' future operations.

Other recent personnel adjustments in the automobile industry include the resignation of the Seaman brothers, Harold H. and Irving, from the Seaman body division of Nash-Kelvinator Corp. at Milwaukee. This move had been expected ever since the merger of Nash with Kelvinator, and has reawakened reports of Nash transferring its body building operations to Detroit or vicinity.

■ AN UNUSUAL tale of a typical headache confronting manufacturers these days is the experience of a large gear manufacturer supplying the automobile industry. At this plant gears are processed in production lots and the sudden mounting of rejections after heat treat to a figure around 40 per cent was vexing the management. Gears appeared to be O.K. in the green, but after heating and quenching almost half of them were unacceptable.

Careful check revealed no discrepancies in processing procedure, and officials were at a loss to explain the trouble. Finally it was decided to dump all quenching oil, about 30,000 gallons incidentally, and clean the tanks. This was done and during the cleaning process one of the men became violently ill. Doctors diagnosed his malady as toxic poisoning from gas in the tank.

The investigation was carried further and it was discovered ultimately that some malcontent had dropped a quantity of chemicals in the quenching oil which produced gas pockets and otherwise made the oil unfit for quenching. When the oil was replaced, all difficulties with the gears disappeared. Thus the entire loss of time and expense of rejects and renewing quenching oil had to be charged to labor sabotage.

As typical of the care which the modern motor car receives in its manufacture, A. E. Jones, Plymouth chief inspector, supplies the information that in routine production a Plymouth standard model passes through 1645 separate inspections of chassis or chassis parts, and another 475 inspections of the body. The steering system alone receives 97 inspections cylinder block over 50.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

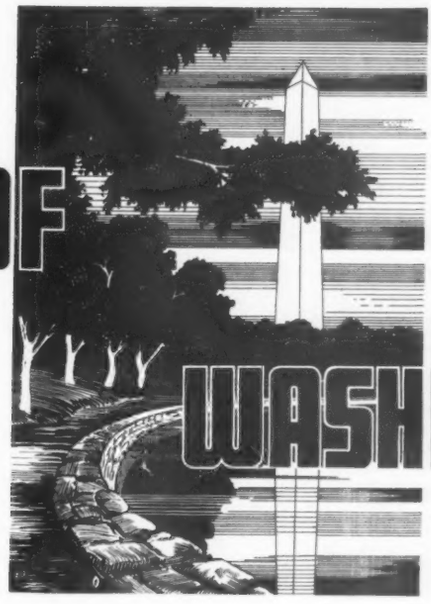
	1936	1937	1938
Jan.	377,244	399,186	227,744
Feb.	300,810	383,900	202,872
March	438,943	519,022	238,753
3 mos.	1,116,997	1,302,108	669,369
April	527,625	553,231	*245,000
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Estimated.

Week ended	
April 23	60,563
April 30	50,755
May 7	53,385
May 14	47,415

(Production figures for the week ended May 21 will be found on page 26.)

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ THE ADMINISTRATION has been interested for several years in residential building as an entering wedge to more business.

The division of economic research of the department of commerce has recently made calculations showing prospective increases of families in the United States. Over the decade from 1935 to 1945, indications point to an average increase approximately equal to the 1935 figure, which was 500,000. In appraising the situation, commerce department officials say approximately 100,000 units should be added for replacement of structures by demolition and other causes, making a total of 600,000 homes which must be built each year to meet current needs for the next few years.

The survey shows present conditions in the house market today are much like those in the immediate post-war period, which was characterized by a rapid increase in the number of families, followed by acute shortage, particularly in 1922 and 1923, with a consequent rise in rents and property values. In discussing this matter at a press conference last week Secretary Roper said:

Housing Must Be Doubled

"In 1932 and 1933, due to the large number of vacancies existing at that time, stimulation of residential building was extremely difficult. In 1937, for the first time, we approached an actual shortage of available dwelling units in many cities. Although last fall and winter building was curtailed, due to a temporary decline in family incomes and to increased wage rates and other costs, the prospective shortage in terms of the much larger number of families added each year than units built was changed. Without regard to the social needs for improved housing for many of our people of low income and solely in terms of actual economic demand, a shortage of dwelling units appears almost inevitable unless building volume can substantially double the 1936 and 1937 level. In these years the number of units added was approximately half the number required to house the new families added in each of these years. It is highly important that in making these plans for the next few years business men give careful consideration to these significant conditions in the housing market."

BILLION DOLLAR NAVY EXPANSION BILL SIGNED

The President has signed the new billion-dollar navy expansion program, which finally passed both houses of congress. The bill provides for 46 fighting craft, and 26 auxiliaries, besides a large number of airplanes. The story in Washington is that the navy department is anxious to start work on some of these ships at once.

Admiral William D. Leahy, chief of operations, stated last week that the navy is anxious to get an immediate appropriation of some $12,000,000 with which to start two cruisers and some auxiliaries. The bill, which is before the President for signature, authorizes the construction for this navy building, but makes no specific appropriations.

The navy's highest officer indicated there was no intention of undertaking construction now on any of the three 45,000-ton battleships provided by the measure.

"We don't plan to have more than six battleships building at this time," he explained. "The navy is building two, and has, or has requested funds to start four others." All are of 35,000 tons and will replace obsolescent craft.

Leahy emphasized the expansion bill provides for an orderly program spread over probably ten years.

Ships built under it will be in addition to others, replacing vessels too old for defense purposes.

Sixty-three such replacements, authorized in 1934, are being built now, and the regular $546,000,000 navy appropriation bill for the fiscal year beginning July 1 included funds to start 22 others.

Authorizing a 20 per cent increase in the fleet's total tonnage of modern warcraft, the expansion bill was the second major recommendation in Mr. Roosevelt's January national defense message to be enacted. He signed last month a measure to create an army enlisted reserve of 75,000 men.

NLRB ASKS SUPREME COURT RULING ON ORDER RECALL

The Supreme Court has been asked by the national labor relations board for a ruling on the board's power to recall orders. The specific ruling was requested in the Republic Steel Corp. case in which the board ordered the company to reinstate several thousand workers involved last summer over the signed contracts between several steel companies and the CIO.

The labor board has been denied permission by the United States circuit court at Philadelphia to reopen the Republic case and the court restrained the board from "taking any steps" before certifying the hearing records to the court. The board thereupon asked the Supreme Court for a writ of mandamus.

Labor board officials said the Wagner act gave authority to set aside or change orders before certifying case records to courts where its rulings were contested.

The board announced it desired to reopen the Republic case to con-

form to the procedure the Supreme Court held quasi-judical bodies should follow when it invalidated last month a department of agriculture order against Kansas City livestock commission men. Republic attorneys asserted the board wanted to "doctor up" the records.

In the Kansas City case the court objected because the commission men had not been permitted to rebut findings of fact by a department examiner.

QUIETUS ON STRUGGLE FOR FOREIGN TRADE SERVICE

The five-year-old dispute between the state department and the department of commerce in connection with foreign service officers of the latter department broke out anew in Washington last week. The fight was so bitter at one stage that rumors were current that Secretary of Commerce Roper would resign. Speaking of this, Secretary Roper said "transfer of foreign service is matter now being considered by the two departments. No conclusion has been reached about it; therefore, no resignation is pending."

For many years the department of commerce has maintained its own foreign service officers who are known as trade commissioners and commercial attaches. They have had economic and business training, and are particularly fitted for reporting foreign business news to the commerce department, which is disseminated in many ways to business interests.

Ever since Herbert Hoover left the department of commerce the state department has been seeking to get these foreign service officers under its own wing. For the moment at least, this matter has been quieted as the administration does not desire any cabinet resignations just before the coming political campaign.

NINE STRATEGIC METALS LISTED FOR WAR STORAGE

Considerable interest has been aroused by the bill introduced by Senator Thomas, Utah, which provides for acquisition and storage of strategic war minerals.

The bill authorizes, but does not actually appropriate, $25,000,000 for four years to acquire and store certain war materials.

Senator Thomas said it is the result of long study, and expressed the belief the bill might be passed and sent to the White House before adjournment. The measure was drafted by government experts representing the interested departments, including war, navy, state, interior, and commerce. The senator called attention to the fact that provision for so-called strategic and critical minerals is an essential part of the navy expansion program and other efforts to build up a national defense.

The Thomas bill would permit the war and navy departments to buy war minerals which are available only by importation and by development of domestic sources. The purchases would be stored on military and naval reservations, to be used only in war-time or when the President decided a defense emergency existed.

The war department lists 22 commodities as "strategic" because of entire or heavy dependence on foreign sources, and nine of these are metals, aluminum, antimony, chromium, manganese, mica, nickel, mercury, tin and tungsten. The army has a secondary list also of "critical" materials.

Senator Thomas said the senate proposal would dovetail with the navy's efforts to build up its stocks of such materials as silk, tin, manganese and chromium, for which it has spent more than half of a $3,000,000 appropriation congress voted last year.

He emphasized that development of domestic sources, as well as the creation of stocks of imported materials, was contemplated.

PRESIDENT SEEKS TO CUT QUESTIONNAIRE BURDEN

Numerous complaints have been received recently at the White House, President Roosevelt said at a press conference last week, that industry is being flooded with government questionnaires. The President has written to Dr. Stuart A. Rice, of the government central statistical board, asking him to make a survey to determine the nature and duplication of these questionnaires. This is an effort, the President stated, to have them cut if possible.

The complaints, which are not by any means new, state that these reports are not only great inconveniences to industry because of their number but cause considerable expense as well. The President said he was much concerned at the mounting demands on business for these data. He asked that Dr. Rice report back to him by Jan. 1 the result of his investigation.

CONGRESS PLANS TO END SESSION BY JUNE 4

Following a conference by the President last week with majority leaders of senate and house it was announced that a drive would be made to adjourn congress by June 4.

Administration leaders are still anxious about the hours and wages bill and its chances of enactment during the present congress. The way was apparently cleared about ten days ago to bring this bill up last week but house leaders would not follow up their advantage. The bill is due for action this week. All indications point to the fact that this bill will pass the house without much difficulty, but it will have to go to conference and difficulty is expected there.

HOOK ASKS ACTION TO AVERT HARM FROM FRANC

Devaluation of the French franc is likely to have far reaching effect on our trade with that country, Charles R. Hook, president of the American Rolling Mill Co. and of the National Association of Manufacturers, told Secretary of State Hull in a communication last week, in which he expressed the opinion that the reciprocal trade agreement which we have with France may need modification.

Mr. Hook called the secretary's attention to the fact that the action of the French government "is of profound interest to American industry and commerce, and it is quite likely that the effects of this depreciation will be far reaching." This is the first instance since the initiation of the reciprocal trade agreement program, Mr. Hook said, "that the currency of one of the signatories has suffered such a drastic decline."

Mr. Hook said: "As a safeguard against the possible effects of any especially wide change in the relative value of the currency of the two countries, there was included in the agreement a provision that if such a change occurred which would prejudice the industry of either country, the country affected could propose negotiations to modify the agreement or terminate it on a thirty-day notice.

"The violent changes which have occurred may have serious repercussions on American manufacturing, production and factory employment. We respectfully request that the state department investigate the situation thoroughly and consider the advisability of opening negotiations looking to a modification of the present agreement."

SCRAP EXPORT BILLS NOT TO BE ACTED ON NOW

Senator Thomas, Colorado, chairman of the subcommittee of the senate military affairs committee, who had charge of hearings dealing with the prohibition of exports of iron and steel scrap, except under license, has made what he terms "a pigeon-hole" report to the full committee.

By this Senator Thomas means that he made neither a favorable or adverse report. On the other hand, he simply recommended that the whole matter be pigeon-holed for the present session of congress.

Industry Can Strengthen its Position By Eliminating Wasteful Practices

■ DESPITE persistency with which steel production clings to a level of about one-third of capacity, the steel industry is contributing rather notably to the current volume of business in so-called capital goods. It now seems likely the industry in 1938 will spend considerably more for plant improvement than the $165,000,000 that was earmarked in January.

Reason for much of this spending by the industry is the necessity—created by recently enacted restrictive laws—of departing from the former policy of living in lean times on surpluses built up in times of prosperity. As the result of their effort to keep costs within income, some ably managed steel companies now show a profit while operating at around 35 per cent of capacity.

This advantage has been achieved with steel selling prices that average only 16 per cent higher, as against taxes that are higher by 60 per cent and wages that are higher by 31 per cent. It has come about by eliminating unessential steps in the production of steel and by further mechanization where possible. This economy drive continues, with every indication of further impressive results.

Saving Rather than Spending New Keynote in Sales Appeal Program

In the metalworking industries the trend is less pronounced. Most large companies are postponing action on plant improvement plans. Much of the current business is coming from smaller companies where ownership and management are more closely tied together. Potentially the requirements of the metalworking industries are huge. The only question is how soon the many projects now dormant will be revived.

Can it be that the delay in unlocking this great log-jam of business is due to lack of adequate sales mindedness on the part of equipment manufacturers? That this is the reason at least in part was indicated by discussions at the recent convention of the National Machine Tool Builders' association. In fact, equipment builders themselves freely admit that they do a much better production than sales job.

Unfortunately, too few equipment manufacturers are adequately armed with the kind of information needed in selling under today's conditions when managements are forced to be prudent in conserving their assets. Sales appeals based on a psychology of spending are not compelling. What is needed today is emphasis on "saving." It is this objective that is motivating the purchase of equipment by the steel industry.

Losses by Obsolete Equipment Best Argument for Buying Efficient Tools

Early last year installation of a new furnace at a metalworking plant was recommended. Consummation of the project was postponed and a few weeks ago the furnace company sent the prospective customer an itemized cost statement. It showed the amount the company was out of pocket each day by not having the new unit. The order was placed without further delay.

This is not a good time for the manufacturer who waits for his customers to get in a spending mood. It is a good time to study customers' operations and show them the money they are out of pocket through inefficient practices. It is a good time to educate industrial management that tension on the purse-strings should not be at the expense of efficient production.

Rate of Industrial Activity Drifts Listlessly

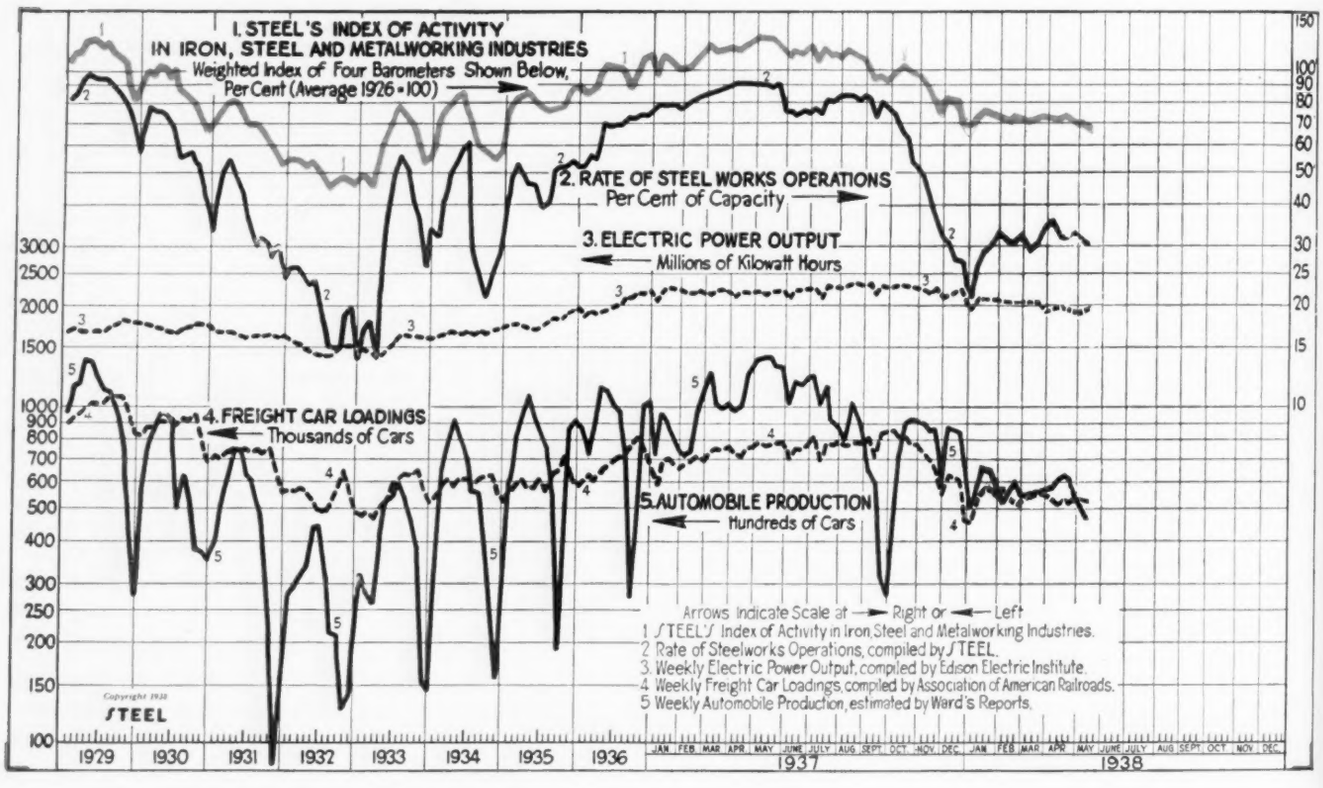
■ CONTINUED sluggishness in new demand is reflected in the downward or sidewise movement of most industrial barometers. This condition in the iron, steel and metalworking industries caused STEEL's index to recede to 67.0 per cent in the week ended May 14. This represents a decline of 1.5 points from 68.5 per cent in the preceding week.

The continued downward tendency manifested by the index reflects the disappointing reports for three out of four of the business indicators from which the index is derived. The rate of steelworks operations slipped off to 30.0 per cent of capacity, registering the third consecutive weekly decline. The rate of ingot operations now is at the lowest level since the week ended March 12.

Automobile assemblies receded to 47,415 in the week ended May 14, breaking into new low levels for this year. In fact this is the lowest weekly production since Oct. 2, 1937. Revenue freight car loadings suffered a further set-back in the week ended May 14 to approximately 530,778 cars. Freight traffic has fluctuated considerably during the past six weeks, failing to develop a clear cut trend.

Electric power production was the only barometer composing STEEL's index to register a gain in the week ended May 14. The increase was of substantial proportions, regaining all the ground lost since the week ended April 9.

The current declines in the steelworks operating rate, revenue freight carloadings and automobile production have forced STEEL's index into new low levels for any full week this year.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 1.5 points to 67.0 per cent in the week ended May 14:

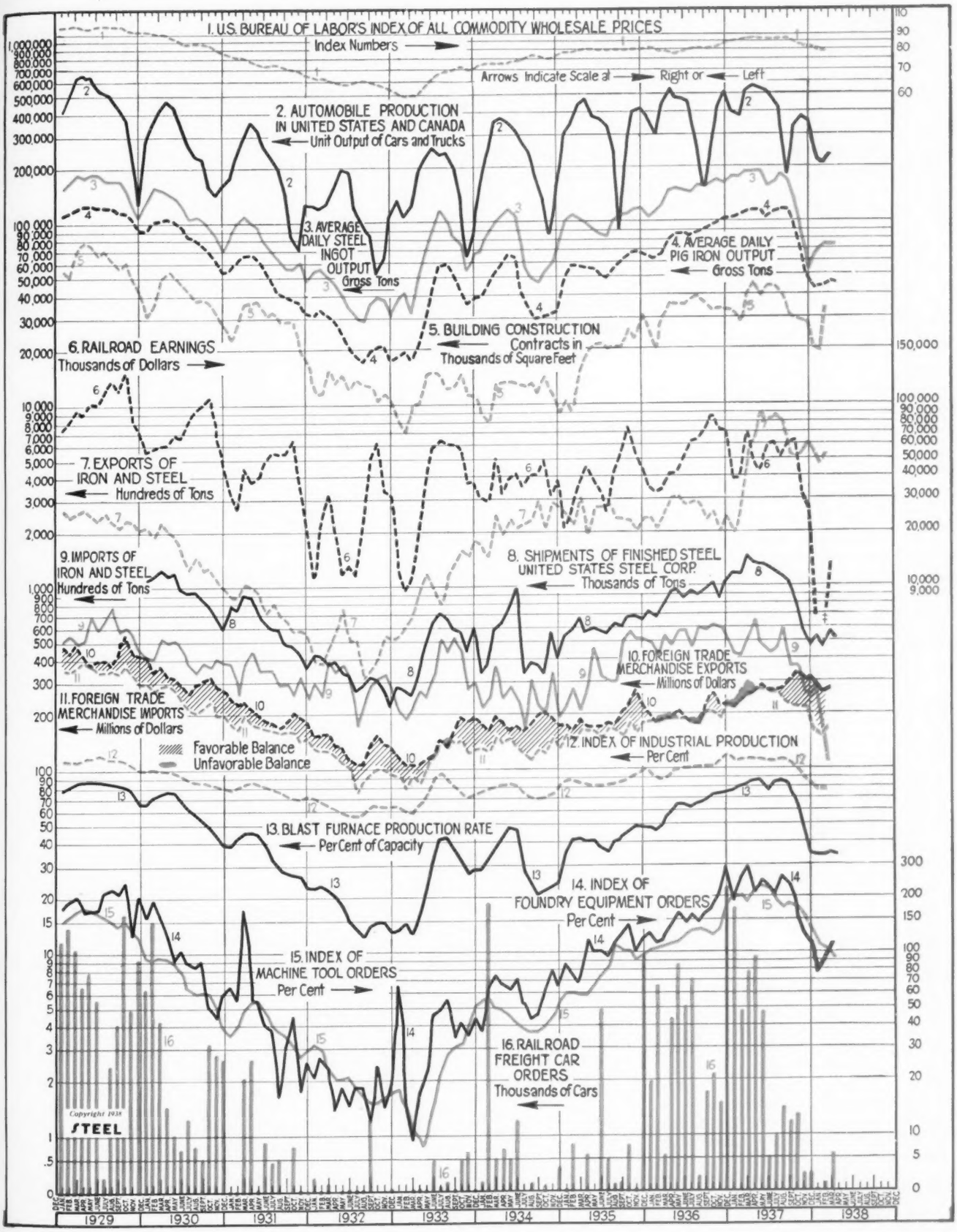
Week ending	STEEL's Index of Activity Index No. 1938	1937	Steelworks Operating Rate Per Cent 1938	1937	Electric Power Output Million KWH 1938	1937	Freight Car Loadings 1938	1937	Weekly Auto Output 1938	1937
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8	112.7	30.0	87.0	2,014	2,212	556,664	748,993	57,438	101,684
Mar. 19	71.3	113.1	32.0	89.0	2,017	2,211	540,332	759,269	57,555	99,013
Mar. 26	72.4	114.0	35.0	90.0	1,975	2,200	572,952	761,109	56,800	101,046
Apr. 2	72.0	112.0	36.0	91.5	1,978	2,146	523,489	726,687	57,500	97,005
Apr. 9	71.3	112.8	32.0	91.5	1,990	2,176	521,978	716,044	60,975	99,196
Apr. 16	71.4	119.6	32.0	91.5	1,957	2,173	537,595	751,328	62,021	125,472
Apr. 23	70.8	122.0	32.5	91.5	1,951	2,188	523,767	761,182	60,563	133,164
Apr. 30	68.4	123.9	32.0	91.0	1,938	2,193	543,075	782,423	50,755	139,475
May 7	68.5†	123.5	31.0	91.0	1,939	2,176	536,140†	767,481	53,385	140,188
May 14	67.0*	123.2	30.0	89.0	1,967	2,194	530,778*	773,669	47,415	140,396

*Preliminary. †Revised.

STREND

Key:	March, 1938	Key:	March, 1938	Key:	March, 1938	Key:	March, 1938
1	79.7	5	34,055,000	9	11,827	13	33.4*
2	236,300	6	14,470,444‡	10	275,711,000	14	114.6
3	74,045*	7	526,833	11	173,405,000	15	91.0*
4	46,267*	8	501,972*	12	79.0	16	15*

*April. ‡Deficit of $2,136,481 in February not shown on chart.



Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

Foundrymen Improve Product Through Extensive Research

Gray Iron

■ THREE technical sessions and a roundtable luncheon were devoted to the field of gray cast iron. Interest ran high with all meetings well attended and providing a wealth of discussion. Nine papers were presented on various phases of chemical compositions, physical properties, and melting practice, and, as would be expected, the newer high-strength alloy irons came in for a good share of attention.

The two papers read at the first session covered different aspects of one general subject, the enameling of cast iron. R. B. Schall, research engineer, Ferro Enamel Corp., Cleveland, presented one paper on "Hints on Molding and Preparation of Castings for Enameling," while G. H. Spencer-Strong, Porcelain Enamel & Mfg. Co., Baltimore, read the second on "Relation of Microstructure to the Enamelability of Cast Iron." The former paper was extremely practical in nature; the latter theorized somewhat and indicated that a considerable amount of investigation will be required before it is safe to generalize.

Design Affects Enameling

Following an introduction touching on enamel as one of the most beautiful, useful and practical finishes for cast iron parts, Mr. Schall directed attention to influence of design, sand, molding and casting features on the success of the finished product. Accuracy of dimension with proper clearances and tolerances are fundamental requirements. The author referred to the fact that large flat surfaces are difficult to enamel principally because of difficulty in obtaining uniformly clean surfaces on the castings and a homogenous metal structure. Sharp corners should be avoided, since enamel will not remain on the thin line. Gradual curves should be substituted for corners.

After a suitable design has been developed, all factors conducive to warpage and buckling in the enameling furnace should be considered and suitable precautions taken to prevent the formation of hair lines, poor fit, and blistering. A considerable part of the paper was devoted to sand and the properties required in this material for making molds. The speaker did not favor the use of graphite facing on the molds.

Mr. Spencer-Strong discussed the relation of the microstructure of enameling iron to the enamelability as concerned with the four major enameling defects caused by the iron, namely, blistering, hair lining, poor adherence and warping. Blistering is the most prevalent defect. Effect of iron oxide, chill structures, inclusions and blow holes and of the effects of graphite, free carbon and the decarburization of pearlite were considered in considerable detail.

Properties Versus Section

Because it has long been recognized that physical properties of cast iron are so related to size of the section in which the iron is cast that one should not discuss properties without explicit knowledge of the section under consideration, E. R. Young, V. A. Crosby and A. J. Herzig, Climax Molybdenum Co., Detroit, presented at the second session a paper intended to throw further light on this subject. The authors had gathered data on 68 different plain and alloyed irons from companies in various parts of the United States to study physical properties in 2-inch sections. Results were obtained from data on A.S.T.M. type "C" bars, 27 inches long, broken on 24-inch centers to provide transverse test data.

Tensile tests were made on bars machined from the broken sections of the transverse bars. Brinell tests also were made. From these data, modulus of resilience and modulus of rupture were calculated. Impact tests on 1.125-inch diameter round, ground bars machined from the broken half of the 2-inch diameter arbitration test bars also were made.

On the basis of their investigation, the authors concluded that 70,000 pound per square inch tensile strength cast iron unheat-treated in 2-inch section today is available commercially, and irons containing approximately 2.50 per cent carbon and 2.50 per cent silicon, when properly alloyed to obtain a balanced structure with approximately 300 brinell and processed for normal graphite, produce maximum physical properties in 2-inch section.

In a written discussion, R. S. MacPherran, Allis-Chalmers Mfg. Co., Milwaukee, expressed doubt that it is advisable to establish specifications based on the information developed by this paper. He pointed out that only a limited number of samples fell within the 70,000-pound range.

Relieving Dendritic Condition

Garnett Phillips, International Harvester Co., Chicago, asked whether there is any treatment that can be given overheated iron to overcome the dendritic condition and poor physicals. Replying, Mr. Crosby asserted that addition of ferrosilicon not more than 2 minutes before pouring is effective in bringing the iron back. Another speaker stated his shop had good success by adding silicon and graphite.

Reporting on an investigation of the effect of varying blast pressures on cupola melting and on properties of the resulting iron, J. T. MacKenzie and C. K. Donoho, chief metallurgist and assistant metallurgist, respectively, American Cast Iron Pipe Co., Birmingham, Ala., con-

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PRESENTED on this and succeeding pages are reports of various technical sessions held during the forty-second annual convention of the American Foundrymen's association in Cleveland, May 14-19. Additional reports will appear in next week's issue of STEEL.

cluded that their results indicate blast pressure may be varied widely to change the melting rate, and that except for slight changes in analysis, the melted iron will show no undue variations from normal. Separate heats were made in a 21-inch test cupola using a wide range of blast pressures and two different kinds of metal charges.

This paper raised the old question of what is normal blast pressure and whether it relates chiefly to variation in cupola diameter and design. Dr. MacKenzie stated that type of coke influences blast pressure—higher pressures can be used with by-product coke than beehive. Mr. Phillips suggested that pressures would vary with charges. Mr. Donoho mentioned that beyond certain pressures, lining attack will be accentuated.

Attempts Coke Correlation

J. A. Bowers, melting superintendent, American Cast Iron Pipe Co., Birmingham, Ala., summarized a paper on foundry and laboratory characteristics of cupola coke, prepared by Hugh O'Neill, chief metallurgist, L. M. S. Railway, Darby, England, and J. G. Pearce, director, British Cast Iron Research association, Birmingham, England, and originally presented before the Institute of British Foundrymen in June, 1937. Although the authors pointed out that the correlation between cupola and laboratory tests had proved rather unsatisfactory, the paper constituted an important step in throwing light on an extremely important foundry subject.

A detailed discussion of cupola operation constituted the official exchange paper of the Association Technique de Fonderie de France, prepared by Marcel Dudouet, professor, Ecole Superieure de Fonderie, Calvados, France. The paper was translated and abstracted by W. H. Spencer, metallurgist, Sealed Power Corp., Muskegon, Mich.

Problems related to metallurgical control of cast iron ocupied the time of the third session.

Presenting a paper on "Deoxidation and Graphitization," R. G. McElwee, Vanadium Corp. of America, Detroit, reported on an investigation made to effect better control of physical properties of iron in castings requiring abrupt changes in section. What is sought is close control of hardness of light sections without at the same time experiencing graphitization of heavy sections.

Experiments were made with cast wedges about 12 inches long with the large end having a section about 2 x 2 inches. These were cast in such a manner as to permit control of the chill in the thin section and graphitization in the heavy section. The author discussed the effects which deoxidation exerted upon graphitization.

Discussing the paper, G. F. Comstock, metallurgist, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., asked if aluminum displayed any distinctive effect in deoxidation, as compared with titanium. Replying, Mr. McElwee said that titanium appears to be a little more sensitive and its effect does not last quite as long as aluminum.

Comparative effects of late additions of titanium and silicon to gray cast iron were considered in a paper prepared jointly by Mr. Comstock and E. R. Starkweather, development engineer, Titanium Alloy Mfg. Co., Niagara Falls, N. Y. The paper gave results of tests on three grades of iron, each containing various amounts of chromium, and treated shortly before pouring with either foundry ferrotitanium or ferrosilicon. A comparison of effects of these late additions showed that with few exceptions increasing ferrotitanium additions gave increased strength and hardness, while increasing ferrosilicon additions gave either a smaller increase in those properties or a decrease.

According to Mr. Starkweather, the difference in effects of these two alloy additions was more marked as amount of the additions increased. The improvement resulting from the titanium additions was due largely to finer graphite and was more definite in higher-carbon or higher-sulphur irons. Sulphur was found to be effective in suppressing dendritic microstructure in the low-carbon chrome-titanium irons. The irons treated with titanium showed fewer flaws in the fractures of the test bars than either the untreated irons or those treated with ferrosilicon.

Studies Freezing Mechanism

Castings usually go into service with the structure which originated during solidification and a knowledge of the mechanism of freezing, is useful to those attempting to control physical properties. Foundrymen, therefore, are interested in the size and distribution of graphite flakes. Recently Alfred Boyles, Battelle Memorial institute, Columbus, O., prepared a paper describing some experiments on this subject. In an attempt to formulate a theory on the basis of that work, Mr. Boyles prepared a second paper explaining the variation in size of graphite flakes in terms of composition gradients set up during the freezing process, and relating such gradients to variations in sulphur and manganese together with the conditions under which the iron is melted.

Conclusions reached were:

In hypoeutectic gray iron, graphite flakes form during freezing of the eutectic and grow radially from the crystallization centers of the eutectic liquid. With a given rate of cooling, size of flakes is determined by the rate of graphitization along the solid-liquid interface. Sulphur and hydrogen in solution in the eutectic liquid decrease the rate of graphitization, and the segregation of these elements produces composition gradients around each crystallization center.

The amount of sulphide remaining in solution in the eutectic liquid is determined by the extent to which sulphide inclusions have been precipitated in the melt above the eutectic temperature.

Manganese, by changing the solubility of the sulphide, limits the amount remaining in solution along the solid-liquid interface during the growth of the graphite flakes. An alloy of constant silicon and carbon content can be made to assume a great variety of structures by varying the manganese and sulphur contents and melting under circumstances conducive to a change in the amount of hydrogen in solution in the molten metal.

Service Determines Structure

In discussion, F. J. Dost, Sterling Foundry Co., Wellington, O., asked what type of structure is best for wear in machine tool castings. He stated his plant had been striving for a pearlitic structure. H. Bornstein, Deere & Co., Moline, Ill., said this could be answered only by experience. In automotive cylinders, for example, pearlitic structure is best, but this might not be suitable for some other service.

Graphitization and inclusions in cast iron provided an interesting subject for discussion at the round-table luncheon. J. W. Bolton, Lunkenheimer Co., Cincinnati, observed that 15 or 20 years ago probably only a corporal's guard would have attended a meeting on graphitization, and said the number present at the luncheon indicated the subject to be a live one engaging the attention of a comparatively large number of foundrymen. Commencing with the molten iron where presumably all the carbon is in the combined form, he stated that many factors affect the final condition and distribution of the carbon in the metal as it cools to room temperature. He referred to the time factor and its many allied features as probably the most important.

Referring to certain views on the nuclei theory, J. T. Mackenzie mentioned a peculiar phenomenon observed in a European foundry engaged in the production of centrifugally cast pipe. Direct metal from the blast furnace is poured into a mixer and raised to a temperature of 2732 degrees Fahr. Test bars taken from the first metal in the

mixer show a chill of 6 to 8 millimeters, while metal taken later showed a chill depth on the test bar of 25 millimeters. Despite these apparent wide variations in the chilling properties the pipes cast at any period showed the same physical properties.

Garnett Phillips, detailed results of a series of tests on small pigs, large pigs and flat cakes poured from the same ladle of iron. Melted in the cupola at ordinary temperatures the resulting iron showed considerable variation. Superheated in the electric furnace, all showed the same characteristics.

Other contributors to discussion included R. F. Harrington, Hunt-Siller Corp., Boston, who discussed late additions of alloys; S. C. Massari, Association of Chilled Car Wheel Manufacturers, Chicago, who described the results of a series of tests in developing a low carbon iron for car wheels; Prof. A. E. White, University of Michigan, Ann Arbor, Mich., who predicted wide use of spectrograph analysis in the near future; and H. A. Schwartz, National Malleable & Steel Casting Co., Cleveland who described various incidents in the control of carbon in malleable iron melting.

Refractories

■ Findings of an investigation on effect of blast pressure, nature of charge, length of heat, and diameter of cupola, on consumption of refractories in the melting zone were reported by C. K. Donoho, assistant metallurgist, American Cast Iron Pipe Co., Birmingham, Ala. Tests were made by holding all other factors constant and varying only the one factor under consideration. Refractory consumption was determined by the number of brick required to patch the melting zone after each heat. Figures were averages of 4 to 24 heats.

Tests on various types of refractories indicated degree of attack was roughly proportional to porosity of brick. Effect of increased blast pressure was a linear increase in refractory consumption. Lower per cent silicon resulted in more attack, variation caused by silicon content increasing with higher blast pressures. Consumption was found not directly proportional to time, a 16-hour heat taking from 1.1 to 1.9 the amount of refractories consumed in an 8-hour heat.

Smaller cupola necessitates lower blast pressure to reduce erosion caused by impact of air jets, but even with much lower pressures rate of consumption was higher for smaller cupolas. Basic factor believed responsible for refractory attack is amount of iron oxide present, thus any factor that increases oxidation of metal increases refractory attack. This would explain why higher silicon content produced less attack since silicon oxidizes more readily than iron resulting in less iron oxide and thus less attack.

These conclusions were confirmed by C. E. Bales, Ironton Firebrick Co., Ironton, O., in subsequent discussion. He said this was first paper presenting data to show increased blast pressure cut out refractories faster, although the effect has been known some time. Possibly this effect can be accounted for by higher pressure increasing oxidation with greater attack resulting, he pointed out.

Another speaker asked if composition of slag had been found important. Mr. Donoho showed tables in which limestone flux was found to produce more attack than dolomite, due largely to its being more viscous, and presented other tests where adding 7 per cent of Purite reduced erosion but with 14 per cent Purite erosion was bad, showing that up to a certain point addition of Purite reduces attack. It was pointed out that slag coming out of cupola is not necessarily of same analysis as that which attacks the lining.

In a paper on refractories for foundry ladles, presented by Mr. Bales, three new types of refractories were discussed. Ladle pouring brick, half cylinders stuck in mud ladle lining, are useful in causing metal to pour without slag inclusions. However, these are not suitable for steel foundries due to high pouring temperatures with excessive erosion and tendency to freeze steel in the cylinder.

New Ladle Bottom Tile

Another new refractory is ladle bottom tile, a flat circular disk now used in sizes from 1 to 4 inches thick and up to 30 inches in diameter. Bottom tile eliminates chipping and fitting bricks to make bottom and prevents loose joints developing with subsequent bottom dropouts. It makes a dry solid bottom and prevents boiling.

Third development is rammed linings, made by putting up firebrick or insulating brick against the ladle shell, placing a wood form inside and ramming the space between with plastic material using an air hammer. Most suitable material contains large percentage of free calcium clay instead of ground up bricks; denser plastics seem best for this work. One user reported forty 50-ton heats with one rammed lining, patchwork being used on the last 10.

The English exchange paper, "Characteristics of Silica Refractories Used in the Cupola," by W. J. Rees, University of Sheffield, Sheffield, England, was read by Elmer Carmody, Ada, Mich. Much plastic rammed material is used in England. The paper pointed out the eutectic where fusion point of plaster ramming material dips almost 100 degrees Cent. Better plastics avoid this point which occurs within the 96 to 84 per cent silicon range and 4 to 16 per cent fluorspar range. Good ram material, when heated to 1450 degrees Cent. was found to expand less than 1 per cent which offsets shrinkage if moisture content is below 7.5 per cent.

Foreman Training

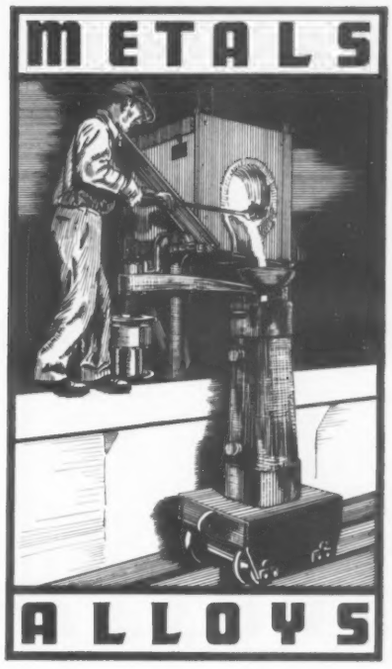
■ One management session was devoted to foreman training. Introducing the subject, A. D. Lynch, J. I. Case Co., Racine, Wis., asserted that in the last five years it has become more than ever necessary to have trained foremen and that, to take advantage of such progressive changes as may come about, foremen must know what to do and how to do it.

Principal speaker was A. C. Horrocks, educational director, National Association of Foremen, and Goodyear Tire & Rubber Co., Akron, O., who stated the foreman's job is not alone that of getting out the work. The foreman must be trained to do the valuable work of human engineering. Saying America is already through the first two phases of its development, financing and mass production, and now, ten years before industry is ready, it is in the third phase which is that of industrial relationship, the speaker stressed the fact that the foreman must take new responsibilities as the middleman between management and workers.

Mr. Horrocks said that the older workers in industry must be used for counsel and advice and that city boys must be given training comparable to that of farm boys whereby the city boy may learn how to work and apply himself.

Considerable discussion after the address turned upon this point when G. J. Leroux, National Malleable & Steel Castings Co., Cleveland, asked whether engineering schools were giving to industry men who could be effective in human relations as well as in technical problems. Mr. Horrocks answered that a few of the more progressive schools had recognized the need of teaching applied psychology and public expression, but that much remained to be done.

G. E. O'Brien, George E. O'Brien & Associates, Cleveland, asked what amount of information should be given to foremen, and discussion bore out that many companies are giving more and more nearly complete information about financial and managerial matters to their foremen and workers.



Mining Needs

New and improved steels and irons make mining equipment more resistant to shock, high stresses, abrasive wear and varying corrosive conditions

PART II

By G. K. HERZOG

Consulting Metallurgical Engineer
Electro Metallurgical Co. of Canada, Ltd., Welland, Ont.

■ WIDE VARIATIONS are found in the amount of alloying elements used. Superior results are obtained only when more than one alloying element is used and the respective amounts of the various alloys are correctly balanced. In the steels of this type commercially, available, such balance has been obtained in practically every case. The ranges of composition of a few steels of this type are given in Table No. I.

In general, the methods used for the fabrication of plain carbon steel can be used without essential changes when working these steels. All ordinary shop tools can be used without change in practice, but because of the greater strength of these steels somewhat more power is required for machining operations.

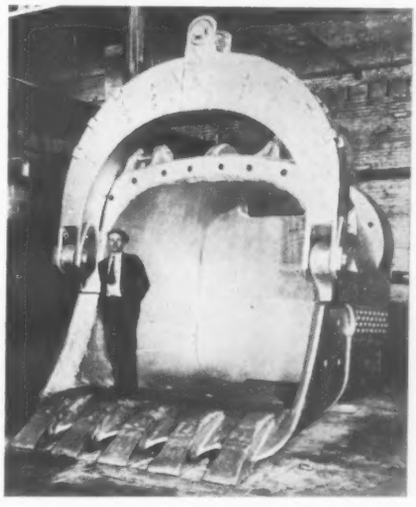
These low-alloy, high-strength structural steels are of particular advantage in applications where decrease of weight without decrease in strength is necessary or desirable. They are being used in mine cars, shovels, dippers, dragline buckets, booms; also in skip hoists for deep shafts where weight reductions as high as 40 per cent have been effected. They are also used for lightweight, heavy-duty, haulage, truck bodies for surface mining or strip operations. Small capacity skips and 40,000 to 50,000-pound capacity, side-dump, air-operated, mine cars for surface strip mine operations have been made from the chromium-copper-silicon-phosphorus steel in Table I. In the case of the mine cars, the use of this steel resulted in reducing the weight from 94,000 to 54,000 pounds per unit.

Economies that can be effected by the use of light-weight alloy steel skips have been described by T. H. Wickenden (Light-Weight skips Improve Efficiency of Nickel Mine, STEEL, March 30, 1936). Plain carbon steel skips weighed 15,000 pounds empty and had a hoisting capacity of 19,000 pounds of ore. Through the use of nickel alloy steels containing 2.5 per cent to 3.50 per cent nickel, it was possible to build skips weighing only 12,000 pounds each and having a hoisting capacity of 22,000 pounds. This amounts to an increase in capacity of more than 16 per cent with no increase in the size of the hoisting cables or power consumption.

Alloys Combat Corrosion

Corrosion is a serious problem in many mines and various materials are used to overcome the difficulties it causes. The problem is exceedingly complex and generalizations are not of much value. As a rule it is best to study each individual case and to select the material most suitable on the basis of tests made with various materials under the actual conditions. There is available, however, a large amount of useful information which is helpful in indicating the type of material which will most likely meet certain requirements.

For handling of acid waters in coal mines a steel containing approximately 28 per cent chromium has for years been giving excellent results. Not only does it have high resistance to corrosive mine waters, but it also has excellent resistance to abrasion so that it has been used largely in applications where both corrosion and wear are severe as pumps, valves, fittings, and pipe handling gritty mine water. Some rather remarkable results have been achieved with this material. Mr. Priestley (Alloy Steels and Their Uses in the Mining Industry, *Mining Congress Journal, March,* 1933) states that in anthracite coal mines bronze has been replaced by 28 per cent chromium steel for pumps for handling high acid water and silt, with the result that no deterioration appeared after a year's service, where the bronze pumps had failed in three months. A 6-inch centrifugal pump of corrosion-resisting bronze in highly acid and silty water showed a life of about two weeks, while a 28 per cent chromi-



Cost of maintaining this 18-yard alloy steel dipper is reduced by using renewable lip

um steel impeller was as good as new after a year's service. In another case the best bronze showed 7.5 per cent loss of cross section in 30 days, while 28 per cent chromium steel in the same service was still in operation after three years.

Another chromium steel that stands up well in service requiring a high degree of resistance to a combination of corrosion and abrasion is one containing 12 to 16 per cent chromium. This steel has been used successfully for several years for perforated shaker screens used for the sizing of anthracite coal, particularly the smaller sizes. Hobart (Economies Through New Types and New Uses of Materials, *Mining Congress Journal*, July, 1932), on the basis of tests conducted by him showed that the "relative cost in service" of the three materials commonly used was as follows: 12 to 16 per cent chromium steel, 0.503; bronze, 0.755; steel, 1.000.

Hobart's figures were based on chromium steel screens lasting 1.6 tims as long as bronze screens. In a number of mines, in tests lasting for several years, it has been conclusively proven that 12 to 16 per cent chromium steel shaker screens last more than twice as long as bronze screens so that in many cases the relative cost for the chromium steel screens is even less than indicated.

Stainless Used

In a number of industries the austenitic stainless steels, usually the grade containing approximately 18 per cent chromium and 8 per cent nickel, variously modified by molybdenum, columbium, titanium or solenium, have to a large extent replaced other corrosion resistant materials. These steels have excellent resistance to the corrosive action of many substances, are available in practically all commercial forms and can be readily fabricated into almost any desired shape by the usual fabricating operations of forming, machining and welding. They are also available in the form of castings.

Despite their excellent properties these steels do not seem to have found any extensive applications in the mining industry. In some western United States mines where the shafts are wet with high acid water, bell or signal ropes of this grade of steel are giving excellent results. In anthracite coal storage yards stainless steel cables placed under the piles to pull and hold the loading device close to the face of the pile are far superior to ordinary steel cables.

At the New York meeting of the American Institute of Mining and Metallurgical Engineers, in February, Walter M. Stephen described the results obtained in the wet screening of finely ground ores at the Copper Cliff concentrator of the International Nickel Co. Ordinary carbon steel screens were pitted and blind with rust within 40 hours while screens made of the 18 per cent chromium, 8 per cent nickel stainless steel gave no difficulty with blinding and did not show any considerable wear after 15 and 33 days, respectively. Indicated life of the stainless steel screens was several months as compared to the 40-hour life of the plain carbon steel. This grade is being used for pump parts for pumping corrosive mine waters. E. Steel (Acid-Resisting Plant for Dealing with Highly-corrosive Pit Water, *Iron and Coal Trades Review*, Oct. 29, 1937) after listing various pump parts made of this grade of steel, states that in use, sleeves of this steel resisted corrosion and remained perfectly smooth whereas a gun metal or phosphor-bronze sleeve became rough and pitted in a very short time.

A high silicon iron containing 14 to 16 per cent silicon has long been used in castings for applications requiring considerable resistance to corrosion or wear. It is too brittle to be used where it is subjected to any considerable shock. An alloy cast iron containing approximately 14 per cent nickel, 6 per cent copper and 2 per cent chromium has been used for various parts of pumps, valves and piping handling certain types of acid mine water, also for parts of equipment for handling leaching and ore dressing solutions.

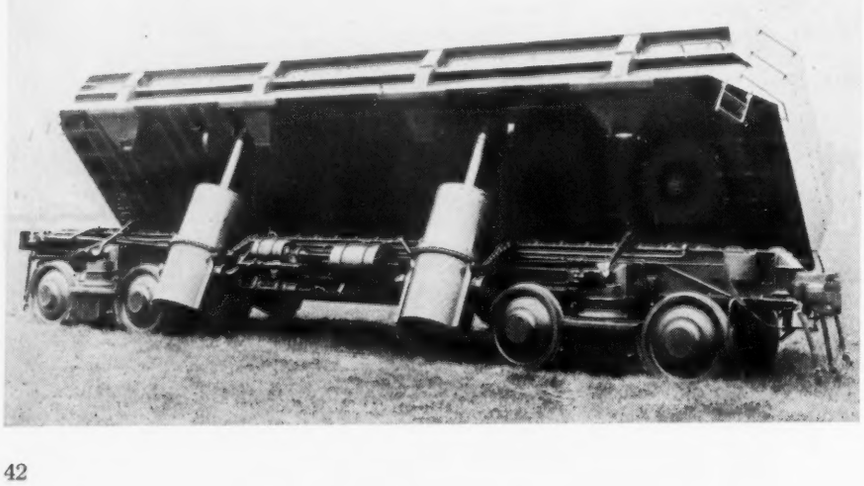
Steels containing 4 to 6 per cent chromium and frequently modified by other elements are widely used in the petroleum industry for service requiring a moderate degree of resistance to corrosion at fairly high temperatures and should find a place in the mining industry.

Low Alloy, High Strength Steels

Some of the newer low-alloy, high-strength, structural steels described earlier in this paper have a considerably higher resistance to atmospheric and some forms of mild acid corrosion than the ordinary carbon steels and will no doubt be used in places where something better than plain carbon steel is required, but where conditions do not justify the cost of the higher alloy steels.

For parts of equipment that must operate at high temperatures, frequently under a combination of highly corrosive and abrasive conditions, the plain carbon steels or ordinary cast irons will often not serve at all and alloy steels or irons must be used. The alloy steel or iron most suitable for any particular application again depends on many factors, and, as usual, economic considerations are of the greatest importance. Almost without exception, the alloys suitable for high temperature applications owe their usefulness to the presence of chromium. Other elements are often added to the chromium alloys to impart particularly desired properties but chromium is the essential element in alloys for high temperature use.

For such parts as rabble arms, columns, plates, plows and disks in furnaces used for roasting copper and zinc ores, the most satisfactory alloy is a steel containing approximately 28 per cent chromium. This steel has excellent resistance to oxidation, to the attack of sulphur compounds and to abrasion at the high temperatures of roasting furnaces. It is available in the form of castings, plates and tubing. A life of more than two years has been obtained with rabble blades of this composition as compared to one to two months for cast iron under the same conditions. This same alloy has given excellent results in various parts of equipment for han-



Made of low-alloy, high-tensile steel, this dump car has greater capacity with less weight

dling hot calcines where a high degree of resistance to high temperature corrosion is required.

Castings of the plain 28 per cent chromium alloy tend to be somewhat coarse-grained and brittle. This defect may be overcome by the addition of a small amount of nitrogen which refines the grain and improves the strength and toughness. Usually less than one per cent as much nitrogen as chromium is sufficient to bring about the desired result. A small percentage of nickel may also be added to improve the physical properties of the castings but this should be kept as low as possible for parts subjected to the action of sulphur compounds.

High Temperature Applications

In high temperature applications where resistance to sulphur compounds is not a major factor, alloys of nickel and chromium relatively high in nickel are frequently the most satisfactory because of their better strength at elevated temperatures. The composition of these alloys cover a wide range, the chromium varying from about 10 to 30 per cent while the nickel ranges from about 8 to 80 per cent. Some of these alloys are so low in iron that they are really not steels at all and are mentioned here because they are particularly suitable for use at high operating temperatures.

The heating resisting chromium steels are frequently modified with certain elements such as tungsten, aluminum, molybdenum, silicon, titanium and columbium in order to impart to them properties required in specific applications. For example, the presence of the proper percentage of columbium in the austenitic stainless steels, containing about 18 per cent chromium and 8 nickel, entirely prevents the intergranular deterioration to which the columbium-free steels of this type are subject when exposed to certain temperatures which may occur either in service or during fabricating operations as in welding.

While Stellite, the cobalt-chromium-tungsten alloy, is usually considered to be an abrasion-resistant alloy, it also has excellent resistance to oxidation and corrosion at high temperatures. Stellite valve seats in heavy-duty truck and bus engines have shown no appreciable wear or corrosion after runs of 100,000 miles or more. This is a remarkable record when one considers that ordinary cast iron seats have to be reground about every 10,000 miles. In the mining industry this alloy has been used successfully for hard facing such heat and corrosion resistant parts as rabble plows and disks.

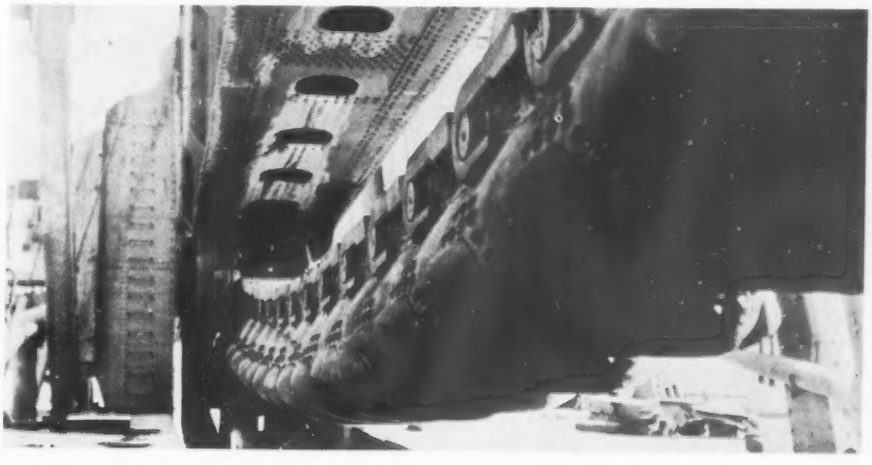
There are many applications where service conditions are not severe enough to justify the use of the high-alloy materials and for such applications a number of low-alloy materials are available. The steels containing 4 to 6 per cent chromium and frequently modified by molybdenum, silicon, aluminum and tungsten, show considerably better resistance to oxidation than do the plain carbon steels and are recommended for use at temperatures up to about 1100 degrees Fahr. These steels will air harden if they are heated to above 1550 degrees Fahr., as in hot forming or welding, and are then allowed to cool in the air. This is a decided disadvantage under some conditions as the air-hardened steel is quite brittle. The addition of titanium or columbium prevents air hardening so that columbium-bearing steel of this type remains ductile and tough even though it is cooled rapidly from working or welding temperatures. Strong ductile welds may be obtained by using a welding rod containing approximately 24 per cent chromium and 12 per cent nickel.

In some high temperature applications oxidation or scaling is not a serious factor but warping and distortion due to growth is. In such parts, for which ordinary cast iron is commonly used, a cast iron containing approximately 1 per cent chromium is giving excellent results. An iron of this type shows no appreciable growth on repeated heating and cooling from temperature up to about 1400 degrees Fahr. It is recommended for many furnace parts such as grate bars, arch bars, door jambs, door frames and other parts exposed to heat which would soon cause cracking or distortion in plain cast iron because of growth.

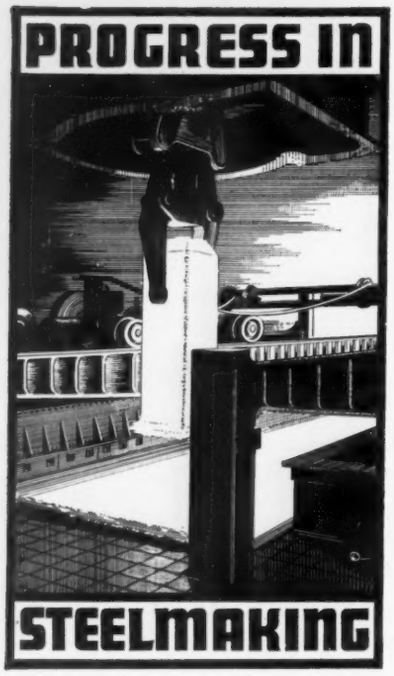
In the chemical and petroleum industries a considerable demand has developed for steels having good properties, particularly toughness, at extremely low temperatures. This demand has been met to some extent by plain carbon steels made in a particular way, that is, with certain deoxidizers added at the proper time and in definite amounts. However, much better results are obtained with alloy steels.

The stainless steels containing approximately 18 per cent chromium and 8 nickel are practically as tough at liquid air temperatures as at room temperatures. Some of the higher nickel and nickel-molybdenum steels also show an excellent retention of ductility at very low temperatures. More recently an aluminum deoxidized steel containing approximately 0.60 to 0.80 chromium, 0.45 to 0.55 copper, 0.70 to 0.90 manganese and a maximum of 0.14 carbon, has been developed for low temperature work. This steel has excellent normal as well as low temperature properties and has economic advantages over other steels with much higher alloy content.

Metallurgical advance has been rapid during recent years. Many new steels have been developed and older ones improved either by slight changes in composition or by better heat treatment. A general knowledge of the many alloys steels and irons now available for applications where it is desired to save weight, increase strength, resistance to wear and corrosion, or to meet other specific conditions, should be of help to the user of mining equipment in determining whether the equipment now in use is made of the best materials available and what materials are available in the event that new equipment is to be installed. There is every reason to believe that in the future the development of new alloys will proceed fully as rapidly as in the past and that if the users of mining equipment will co-operate with the steel mill metallurgists, the mining industry can look forward to obtaining materials suitable for the increasingly severe conditions under which it must operate.



Life of this dredge bucket line is increased by using chromium-nickel steel bucket pins



Auxiliary Slag Pocket

New system makes possible continuous open hearth operation. Slag is removed in a 40-ton block by two men and a crane with the furnace operating

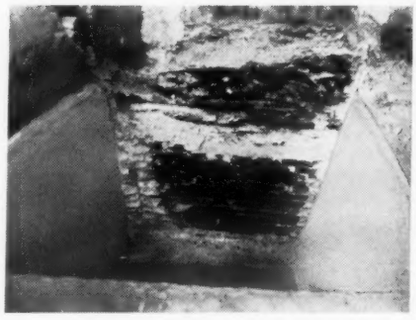
■ A PROCESS, utilizing what is known as the Crowe auxiliary slag pocket, has been developed for continuous removal of slag from open hearth furnaces. It is designed so slag will flow out of the main slag pocket and collect in this auxiliary pocket. By the incorporation of certain engineering features, slag is kept hot and in a fluid state so it positively flows, through the aid of gravity alone, into the auxiliary pocket. No mechanical means are necessary to insure fluidity of the slag. Process was developed and patented by Crowe Engineering Co., 309 West Third street, Cincinnati.

Main slag pocket is free of slag at all times, the ideal condition for maximum working efficiency of open hearth furnaces. Not only are economies effected in fuel consumption but furnace efficiency is as good at the end of a campaign as at the start.

Particularly gratifying is the lack of repairs to the main slag pocket, checker chamber, etc., after a campaign has been completed. Rider walls, checker chambers and arches do not have to be rebuilt because slag does not adhere, burn, or run over them to cause costly damage. Expense, slowness and difficulty of removing slag from the main slag pocket is eliminated.

The auxiliary pocket is simple and economical to install. As a general rule the auxiliary pockets are 8 x 8 x 12 feet, connected with the main slag pocket by an opening in the wall. However, larger or smaller pockets may be used.

When the auxiliary pocket is filled with slag, which can be ascertained by observance through a peep hole, a section of roof adjacent to the main slag pocket is removed by crane and the opening between the two pockets closed.



Hole shown here was recently full of slag which was removed without taking furnace out of service

Quick Removal

Remainder of sectional roof is lifted off. Crane then is hooked on to lifting rods, imbedded in spaces prepared for them, and lifts out the solidified block of slag in one piece for removal to the slag dump. In all, it takes about 30 to 40 minutes to remove the roof and pull out the block of slag.

After inserting lifting rods, relining auxiliary pocket and putting roof on again, the temporary wall sealing the connection between auxiliary pocket and main pocket is pulled down and the auxiliary pocket is ready for operation again. In

Here 40 tons of slag is being removed in one piece. Hole from which it was removed in left background. Block is 8 x 8 x 12 feet

The American • • •
MECHANICAL GOGGLE VALVE

PATENTS GRANTED and PENDING

Hand Operated Design. One hand chain operates Valve. One hand chain swings plate.

for

GAS WASHERS

•

PRECIPITATORS

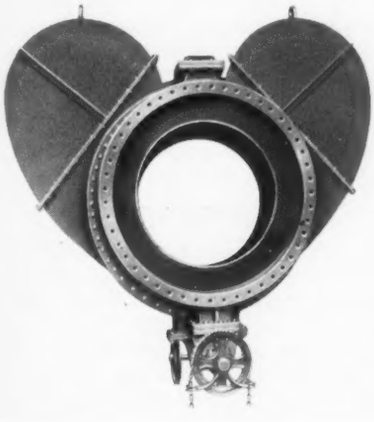
•

BOILER PLANTS

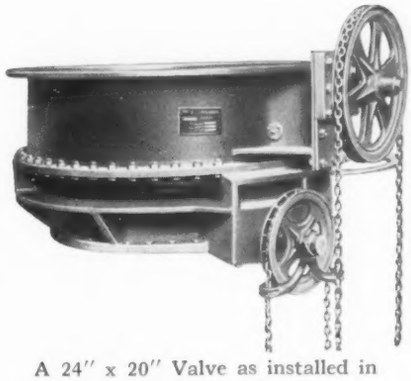
•

BLAST FURNACE GAS MAINS

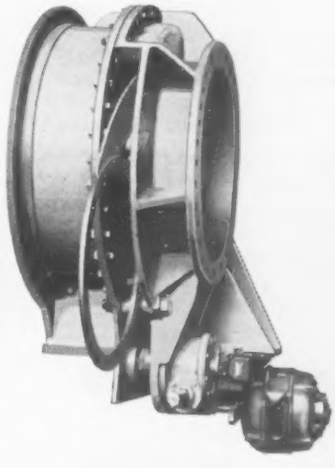
View—Showing Machined Goggle Plate with Chain welded thereon. Sprocket Wheel engaging with chain also cleans the chain if this becomes clogged with dust.



With Totally Enclosed Goggle Plate. No gas escapes to atmosphere when plate is swung to opposite position.

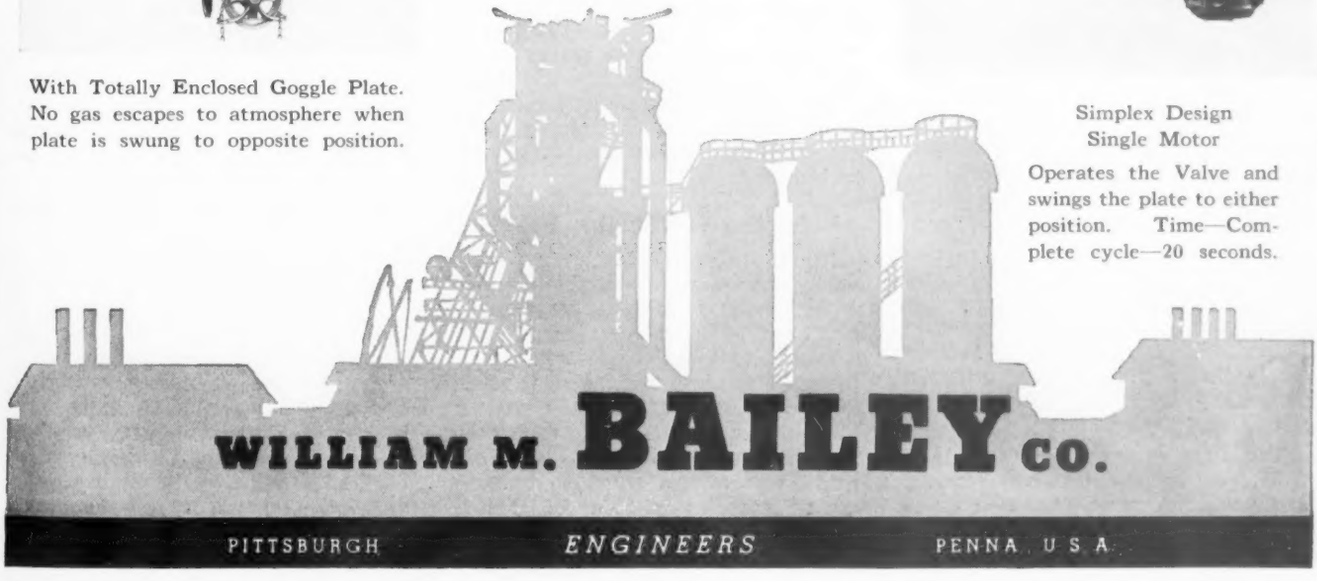


A 24″ x 20″ Valve as installed in Vertical Gas Main to Blast Furnace Stove Burners.



Simplex Design
Single Motor

Operates the Valve and swings the plate to either position. Time—Complete cycle—20 seconds.



WILLIAM M. BAILEY CO.

PITTSBURGH *ENGINEERS* PENNA. U.S.A.

British Institute Conducts Steelmaking Symposium

■ A SYMPOSIUM on steelmaking, which will constitute a valuable reference for future research work on the subject, featured the annual meeting of the British Iron and Steel institute in London, May 4-6. Twenty-four papers were presented in groups according to main subject and covered practice in the Glasgow, Lancashire, Lincolnshire, North-East Coast, Sheffield and South Wales districts.

The Right Hon. Earl of Dudley, chairman, Round Oak Steel Works Ltd., was installed as the new president of the institute, succeeding Alfred Hutchinson, chairman, Skinningrove Iron Co. Ltd. Lord Dudley is immediate past president, British Iron and Steel Federation, and represented British steel interests during a recent visit to the United States, where possibilities of co-operation between American and Continental steel trade interests were discussed.

A. O. Peech, director, United Steel Companies Ltd., was elected vice president of the institute, and all retiring members of the council were re-elected.

Awards Are Conferred

Formal presentation of the Bessemer gold medal to Dr. C. H. Desch was made by Lord Dudley. A sketch of Dr. Desch appears on page 47. The Williams prize, not awarded for the past three years, was conferred upon W. Geary, Linthorpe, Middlesbrough, for his paper, "Hot Metal Practice in Five Melting Shops on the North-East Coast," published in Vol. 2 of the *Journal* of the institute for 1937.

Object of the symposium on steelmaking was to provide authoritative statements of the various open hearth processes, including design of plant and practice, in different districts of Great Britain; to set out differences in practice and reasons for them; to explain changes in recent years and how present-day practice has been developed; to arouse interest in open hearth practice and provoke discussion on differences in design and practice; and to obtain formulation of problems requiring elucidation with a view to initiation of research by the open hearth committee and other bodies.

The first group of papers dealt with open hearth data, refractories and fuels. A paper, "British Open Hearth Data and Their Correlation," was the result of work by the open-hearth committee of the Iron and Steel Industrial Research council and was presented by E. C. Evans, British Iron and Steel Federation, who stated that one of the primary objects of the symposium was to set out problems requiring research, and that they applied to works practice all over the country. As an example, he mentioned in reference to refractories that if only one could increase the temperautre of furnace by 100 degrees, one would immediately derive a great improvement in production. He referred to furnace design, which, he said, is one of the most difficult problems to deal with, and he mentioned two other problems—that of heat transfer and that concerning the nature and control of slag.

Papers dealing with refractories were introduced by Dr. J. H. Chesters, Sheffield, who drew particular attention to basic refractories. He stated that the greatest obstacle to increase of production is probably the problem of refractories, and pointed out that at present there is barely a margin of 35 degrees between the lowest steelmaking temperature and the maximum that a furnace will stand. He said that the obvious material for basic refractories appears to be magnesia, but attempts to use magnesite bricks have so far resulted in failure.

Dolomite is now being used with success, but an outstanding recent development is the use of chrome-magnesite. Bricks made with chrome-magnesite can be controlled as to grain size, and a bond is formed within the brick when it is being used. Disadvantage of these bricks is that the refractory "grows," and finally the bricks break up. However, they do not melt easily, and by controlling their size, improvements recently have been obtained as regards the propensity to bursting.

Refractory Information Needed

In a discussion following this summary, it was stated that not enough matter had been contributed on the subject of refractories, and it was also pointed out that insufficient attention had been paid to silica bricks, which already have a long life and in regard to which research should be continued. One remark was to the effect that study of refractories should be bound with study of furnace design. Reference was made to the variations of the life of furnace linings in different works, indicating that these variations were probably connected with the different slag analyses.

Effect of weekend stoppages on refractories was commented upon, and doubt was expressed whether the saving of fuel counteracted the effect of cooling on the bricks. It was stated that when linings are made with silica brick there is advantage in concentrating the silica in the roof, which can be done partly by the proper design of the shape and size of the bricks, in which British refractory people have made great progress in the past two or three years. Attention was drawn to alumina bricks, with their ability to resist iron oxide corrosion. The question of insulation was brought up and it was mentioned that, as regards open-hearth furnaces, insulation seems to have been more successful in the United States than in Great Britain.

Second group of papers dealt with fuel and was introduced by J. A. Davies, Guest, Keen, Baldwins Iron & Steel Co. Ltd., Cardiff, who mentioned that fuel is the biggest item in the cost of production of iron and steel, but progress has been made in lowering consumption. With regard to producer gas, progress has been largely due to attention to quality of coal and improvement of technique. Some papers showed there is an increase in the number of furnaces where coke-oven gas is mixed with producer gas, and the speaker suggested that in such cases the proportion of coke-oven gas used, which seldom exceed 10 per cent, could usefully be increased to 20 per cent.

Difficulties With Gas

Relatively little was said about use of straight coke oven gas and blast furnace gas. Mr. Davies stated that in use of mixed gas the twin nuisances seem to be hyrogen and high moisture, and he said that a gas with high thermal units and high hydrogen is less favorable to the steelmaker than a gas with a lower thermal unit and lower hydrogen. Papers seemed to indicate that metallurgical burden has an influence on fuel consumption.

In discussion, one speaker stated it is possible to measure producer gas and prevent accumulation of tar at ports by use of steam jets. Another speaker expressed the opinion that fuel economy has not really made much progress in recent years, and that while consumption of fuel has gone down, this is mainly because output has gone up and because of the progress in furnace design, rather than through any developments made by fuel engineer. It was stated that it is not hydrogen *per se* that matters in the use

of mixed gas, but mainly moisture which is harmful. A remark was made about the briquetting of coal, in which case the briquets often disintegrate; this, it was stated, depends wholly on characteristics of the coal used, although it is true that in some cases too much pitch can be used. A remark was made to the effect that coke-oven gas can be used with a high metallurgical charge, but the gas must be used with tar.

R. Percival Smith, author of one of the papers of the Sheffield district, referred to the isolation of gas producers and suggested that it should be recommended. Referring to insulation of open hearth roofs, he pointed out that in Germany steelmakers are careful not to insulate them. Referring to use of a mixture of coke oven gas and blast furnace gas, he mentioned that coke-oven gas is lighter than producer gas, and if a furnace has been designed to be used with producer gas, coke oven gas will not follow the path for which the furnace was made and will burn in certain spots, where the brickwork may deteriorate. Another speaker, also referring to the question of insulation, said that to get the best effect from its use, furnaces should be redesigned, especially as regards the ports, to meet the reduced consumption of gas.

Review Furnace Design

The papers dealing with furnace design and control were introduced by Dr. R. J. Sarjant, Hadfield's Ltd., Sheffield, who briefly reviewed the various factors of furnace design. He mentioned that most of the papers dealt with current-style furnaces, but one or two special types had been dealt with, such as the Talbot and one or two others. The question of roof insulation was well covered, and several papers dealt with instruments of control, recorders, water-cooling, gas-port sizes, etc. Dr. Sarjant suggested that the main points for discussion were: Ideal design of the furnace chamber; whether straight-through valves are better than butterfly valves; automatic control; insulation, and also, how should furnace performance be assessed?

In the discussion, reference was made to automatic control, and the reason for its not being applied more generally was queried. It was stated, in the reply, that automatic control can sometimes be too automatic and may not always comply with circumstances of the moment. The point was also stressed that a place must be given to the human element and to experience of trained furnace men. Attention was drawn to the insulation of furnace bottoms, and the question of thermo-conductivity was raised. In one reference to checkers, it was stated that straight-through checkers are preferable, inasmuch as they are easier to clean. One speaker drew attention to the importance of high gas velocity, and said that relatively high velocity is helpful toward increasing output.

Papers on basic steelmaking constituted another group. Those covering hot metal practice in fixed furnaces were introduced by W. Geary, Linthorpe, Middlesbrough. Dealing with the relation of scrap to furnace burden, the papers generally gave the reasons why various works use certain percentages of scrap in the burden. The conclusion was that individual furnaces now have an output which is substantially larger than before. Many works use mixers. Generally speaking, the carbon content of the metal varies from 3.4 to 4 per cent.

Various methods of charging were described, most papers mentioning charging troubles common to most shops. Considerable attention was given to actual melting practice, covering such points as additions, slag composition, removal of carbon, etc. There appears to be a tendency to use steel furnaces of special design when the proportion of scrap in the burden tends to be relatively high.

Papers on cold metal practice in fixed furnaces were introduced by J. Gibson, Glasgow. Only three papers were contributed on the subject, and it would appear that it is hot metal practice which is most widely used in Great Britain. The works contributing the papers on cold metal practice made 1¾ million tons of cold metal out of 9¼ million tons total output of basic open-hearth steel. One paper particularly raised the question of temperature and slag control. From the description of practice given, it would appear that the principal aim is to increase the output of the furnaces and to reduce coal and refractory consumption. The improvements made in recent years are mainly due to improved gas producer practice and to better handling of raw materials.

The difficulty of handling and charging scrap of a variety of sizes and of light weight was emphasized, and it is apparent that bulk weights vary considerably. Works organization has a considerable influence on handling problems. Other factors, such as routine control, fettling, bath testing, etc., were touched upon in the papers. It seems that use of chilled and machine pig iron instead of sand-cast pigs brings about an improvement.

(To Be Concluded)

Is Bessemer Medallist

Dr. Cecil Henry Desch

Awarded the Bessemer gold medal of the British Iron and Steel institute, is superintendent, metallurgical department, National Physical Laboratory, Teddington, England. Long a distinguished teacher of metallurgical chemistry, he was lecturer at the University of Glasgow; professor of metallurgy, Royal Technical college; and later professor of metallurgy, University of Sheffield. His textbook on "Metallography" has been the classical publication on this subject in Great Britain for many years. Dr. Desch is a leading authority on chemistry of solids, upon which he recently gave a series of lectures at Cornell university. He was appointed to his present post in 1932 to succeed the late Dr. W. Rosenhain. Since that time, he has been in charge of researches in connection with production of high-purity metals, particularly iron. Under his leadership, methods have been worked out for estimating oxygen content of steels. Dr. Desch is a fellow, Royal society; past president, Faraday society and president, Institute of Metals.

Investigate Properties Of Plumbers' Solder

■ An investigation on the working properties of plumbers' solder having a frosty surface has just been carried out by the British Non-Ferrous Metals Research association with the aid of funds provided by the International Tin Research and Development Council, which has now published the results in technical publication series A, No. 73.

Because bad working properties and frostiness may both be produced by traces of impurity, frostiness has come to be considered an almost infallible indication of inferiority. Frostiness is, however, produced on good solder cast into an overheated mold and is due in this case to the growth of large crystals. The report describes how solders were prepared with smooth and frosty surfaces and then used by practical plumbers. It is concluded that frostiness is not invariably a sign of poor solder.

Copies of the publication may be obtained free from the International Tin Research and Development Council, 149 Broadway, New York.

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by
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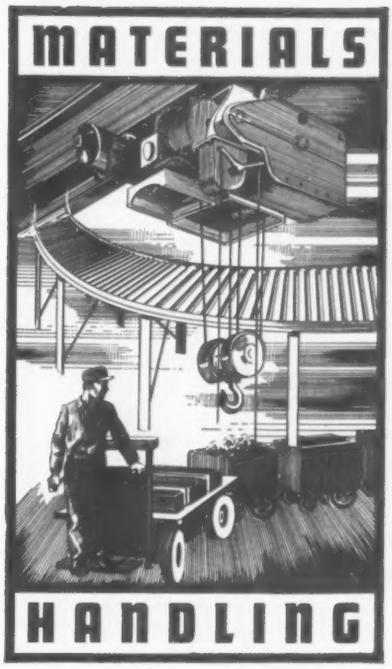

Interplant Shipping

Unit-load system adopted by refrigerator department has reduced total materials handling cost to approximately one-fourth of previous methods. Vendors also profit

PART I

J. A. CRONIN, Materials Handling Editor

By M. H. CUNNINGHAM
General Electric Co.
Schenectady, N. Y.

■ MOST STUDENTS of manufacturing methods concede that the science of materials handling has not kept pace with improved manufacturing processes. There are problems of plant-to-plant, vendor-to-plant, loading, unloading, shop-to-shop, and intrashop moving—all of which are important. Of all these aspects of materials handling, perhaps plant-to-plant and vendor-to-plant operations deserve the most attention. Coupled with the fact that there are vast quantities of bulk material being moved both from plant to plant within a single company and from outside vendors to the individual plants, indicates a real need for specialized inquiry into the problems involved in these operations.

STEEL begins in this issue a 2-part description of an extremely efficient system of interplant shipment developed by engineers of General Electric Co. The author has made a noteworthy contribution to materials handling. He has divided his subject into two distinct phases, the first concerning movements of consignments between company's own plants, the other detailing vendor-to-plant shipping problems. The first of these is covered here

Fig. 1—Former method of packaging and stowing motors. Units were small and high stacking would necessitate elaborate and expensive blocking measures

Recently it has been recognized that improved equipment, specially designed for the purpose, offers many possibilities for wide application in handling materials packed according to the unit-load system.

Fork trucks have been notable among new equipment gaining favor. Their main applications have been loading and unloading, as well as handling materials within the various plants. The most significant development in the fields of plant-to-plant and vendor-to-plant handling, however, has been the adoption of the unit-load method of moving material.

Handle Unit Loads

The refrigerator department at General Electric's Schenectady works, for example, has adopted the unit-load method. During the past ten months this method, in conjunction with the use of fork-type trucks which can enter standard box cars and pick up unit loads, has reduced the total materials-handling cost to about ¼ of the former amount. In addition, bulk material handled in this form has given economies by increasing the volume which can be stored on a given floor area, by assuring better "housekeeping" results, by reducing the number of individual handlings, and by simplifying such operations as sorting, checking, inspecting, accounting, and taking inventory. Another advantage of the system lies in the fact that there is less damage to the material being moved or stored.

In the unit-load method of handling materials, fork-type trucks are used in sizes up to 10,000 pounds capacity. They require but 4 inches clearance for entrance of the forks under the pallet or skid bearing the load. Furthermore they can handle double-faced pallets of unit loads, which are necessary to the tiering of certain types of materials.

Certain types of pallets, skids, and containers must be used to ob-

Fig. 2—Beginning of unit-load methods. This still meant, however, individual handling of packages

tain best results in handling by the unit-load method. Actual study of the materials to be handled is the only key to devising the correct system. In general, though, the experience of the General Electric Company indicates that the following factors may give the solution:

Fig. 3—Complete elimination of blocking, saving of floor space and other economies are apparent in this method of shipping strapped units

Representatives of both the sending and receiving plants should jointly determine the overall size and weight limits of the unit load to be used. Such aspects as floor-load capacity, aisle space necessary for transfer, and facility in handling before and after transportation should be taken into consideration. Cognizance must also be taken of such factors as the size of door openings in box cars and buildings to be involved.

Use Minimum Number

The survey should standardize on the minimum number of sizes of skids, pallets, straps, and bands. This means, of course, a study of the characteristics of the different materials to be handled, as well as of the manners in which they are to be handled.

When making decisions regarding size, weight, and methods of preparing unit loads, consideration should be given to the fact that the load should be prepared to permit delivery, intact, directly to the point of usage in the processing line or in storage.

Refrigerator motors formerly were packed in individual cartons for shipment. This packaging system meant that each motor was handled as a unit. Also when placed in a box car for shipment considerable blocking was required. Floor space was wasted since it was difficult to tier the packages. Each unit was small and high stacking would necessitate the use of elaborate blocking measures as shown in Fig. 1. Then, with the advent of unit-load preparation, the shipping plant began to place more than one motor in a carton. See Fig. 2. This method greatly simplified loading, blocking for shipment, and unloading, but still it necessitated the individual handling of each carton. This improvement merely was a step in the right direction, later development leading to handling these packages by pallets.

In Fig. 3, the final step, involving the use of double-faced pallets and band-iron features, completely eliminate car blocking. In addition, floor space is saved by higher tiering of the cargo. Fork trucks load the pallets on box cars. Upon reaching their destination, the pallets are unloaded by the same method. Finally, they are deposited where needed, almost ready for assembly in the refrigerator as revealed in Fig. 4.

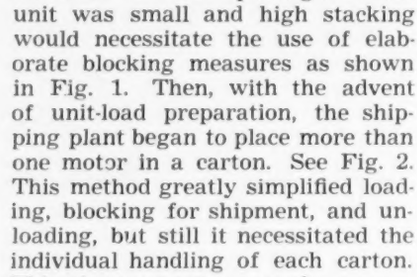

Fig. 5—Cardboard partitions ready for return to shipper, three wire ties making the load a unit

When this unit load of motors has been used, cardboard partitions and pallets are again bundled into unit loads and trucked into the box car for return. Cardboard partitions and sidings are bundled neatly into convenient sized packages, as in Fig. 5, as are the pallet standards in Fig. 6.

Refrigerator parts are sent out from Schenectady. Shipping the varied units involves the use of numerous packing and shipping accessories. Formerly, when these accessories were returned for re-use by Schenectady, it meant considerable expense of loading, unloading, and distributing the packing and shipping fixtures. Piled in a box car for return to Schenectady,

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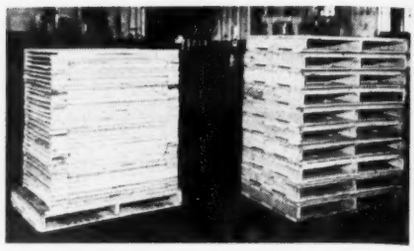


Fig. 6—View of pallet standards ready for return journey to shipper

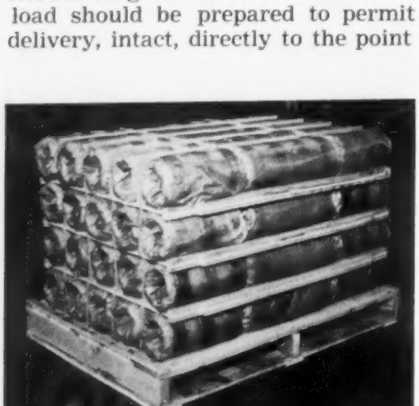


Fig. 4—Unit loads of motors almost ready for use after being unloaded and having cover removed

Rubber Pillow Blocks

■ Ball bearing, rubber pillow blocks, manufactured by Fafnir Bearing Co., New Britain, Conn., are now available with a grease fitting. Fitting is said to permit frequent lubrication with the least amount of trouble. Moulded rubber housing of the pillow block eliminates bearing noise, and makes up for partial misalignment or longitudinal shaft expansion.

Platinum Alloy Metal Patents Are Reviewed

■ *Legierungen der Platinmetalle Patentsalmlung*, (Alloys of the Platinum Metals Patent Review); by A. Gruetzner and C. Goetze; paper, 536 pages, 7 x 10 inches; published by Verlag Chemie, Berlin, Germany; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, London.

Printed in German, this volume is an excellent compilation of chemical patents issued in Germany, England, France, Austria, Switzerland, and the United States from 1886 to May, 1937. It is a part of *Gmelins Handbuch der anorganischen Chemie* (Gmelins Handbook of Inorganic Chemistry), and the various alloys are arranged in alphabetical tables. In each table the first column is devoted to the composition, with percentages if available, the second to the properties or applications, and the third to the inventor, patent number, and country of origin of the patent.

Only a comparatively slight knowledge of German is required to use the book since the various elements are given in the Latin symbols, and the tables begin with an alloy of Ag-Ir and end with one containing Cu-Fe-Mo-Ni-Pd-Rh-W-Zr. In addition the final section contains tables listing the various alloys according to the contained platinum group metal or metals, with a reference to where it appears in the front section.

Diamond Dies Are Used to Draw Fine Stainless Steel Wire

■ CONTINUOUS drawing of fine gage stainless steel wire has been developed to the point where it can be drawn to diameters finer than that of human hair and held within tolerance limits so close that only scientific optical measuring instruments can detect variations in diameter. At the American works, American Steel & Wire Co., Cleveland, wire so fine is produced that 3 miles of it are required to weigh one pound.

Stainless steel wire in gages down to 0.034-inch is produced by standard methods using tungsten carbide dies and the same type of wire drawing machines as used to draw other types of steel. Gages below 0.034-inch are produced on special machines and in a special department.

Diamond Dies Utilized

Wire drawing machines in this department are fitted with diamond dies and can make as many as 19 drafts in a single operation. A few machines are fitted with tungsten carbide dies for the coarser sizes down to 0.025-inch, finished diameter. Process wire, a term applied to wire intended for reduction to smaller diameters, is fed into these latter machines at 0.034-inch diameter.

Since reduction of wire between drafts at this diameter is approximately 10 per cent, it is not always possible to draw it to the finished diameter in a single machine despite the large number of dies. In this case the wire is drawn as far as possible in a single machine and then bright annealed.

Use of diamond dies is a departure from conventional practice and was made necessary by the fact that stainless steel wire can be drawn to gages so fine that the use of tungsten carbide or other die material is not feasible. Another unusual feature lies in the fact that many of the dies are completely submerged in a solution of soap or soluble oil for lubrication and cooling. Other dies are cooled in the conventional manner under a spout of flowing solution.

The extreme accuracy of these dies is illustrated by the amount of reduction between dies at the smaller diameters. To produce wire 0.0019-inch in diameter, for instance, the final reductions are only 0.0002-inch per die. As minute as this reduction is, it amounts to 10 per cent of the final diameter and can only be accomplished with wire of exceedingly high tensile strength. In addition, tolerance limits at this diameter can be held to 0.00002-inch, a variation so infinitesimal that it can only be measured with a scientific optical instrument. This instrument, a Zeiss optometer, is capable of measuring diameters to one millionth of an inch.

Drawing speed with diamond dies varies from approximately 650 feet per minute at 0.009-inch diameter to approximately 1800 feet per minute at 0.0019-inch diameter. Die life also varies according to the diameter; a 0.020-inch die will draw approximately 100 pounds of wire while a 0.0019-inch die will draw 5 pounds of wire on an average. When it is recalled that there are approximately 15,000 feet of wire per pound at the latter diameter, it is seen that this is a long die life. Studies are being made to discover ways and means of increasing die life even further. It has already been found that the use of beeswax on larger diameter wire increases die life appreciably.

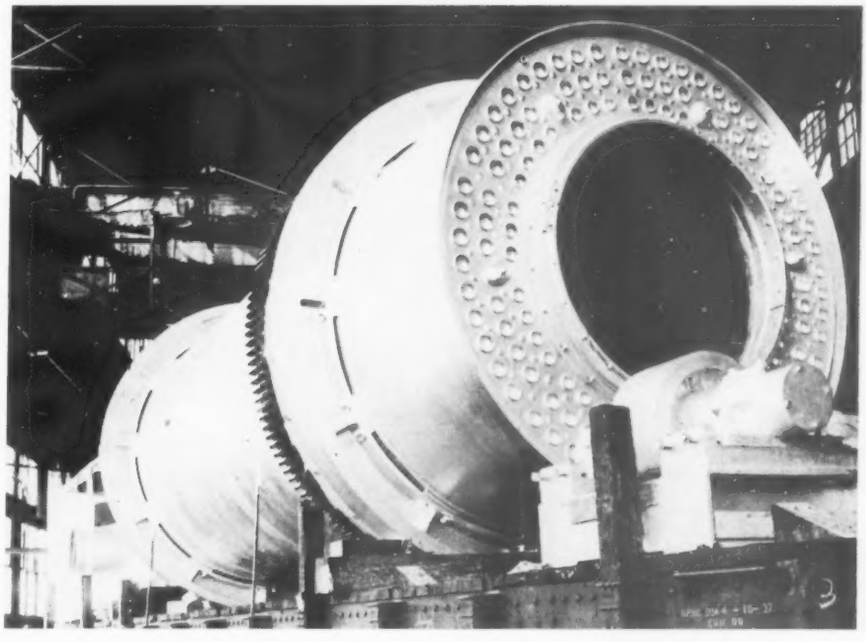
When a die is worn beyond the tolerance limit for its size, it is sent to the die shop to be bored to the next larger size. Diamond boring is a slow, delicate process requiring special machinery which employs diamond dust and olive oil as the cutting agent.

Fine stainless steel wire has a tensile strength in the order of 300,000 pounds per square inch as it comes from the drawing machines. While this high strength is very desirable in most cases, the wire is not ductile enough to be used in the manufacture of screen and wire fabric which are among the largest uses for this wire. The wire is, therefore, bright annealed in an atmosphere of hydrogen to bring it to the desired ductility. In the annealed state, tensile strength is approximately 100,000 pounds per square inch. For special uses, such as fishing line leaders and other applications requiring high-tensile strength, wire is furnished in the unannealed state. It can be furnished for many other specifications of ductility, strength, dimension and finish.

Increases Efficiency

■ Victor Mfg. & Gasket Co., 5750 Roosevelt road, Chicago, has developed a coating known as "Precote" which is applied to sheet steel (mostly terne plate) used in gaskets. Its use is said to eliminate the sealing deficiency common to the use of steel in connection with fluid seals.

Welded Nickel-Steel Mash Drier



■ **Ohio Machine & Boiler Co., Cleveland, recently welded this 45-ton unit from ¼ and ⅜-inch thick, 5 per cent nickel steel. It dries a ton of mash, spent grain from liquor distilling, every hour. Mash takes 15 minutes to dry, being fed between stationary inner mandril, 24 inches diameter by 28 feet long, and outside shell, which carries 144 steam-heated tubes and makes six revolutions per minute. Driven by a 20-horsepower motor and maintained at 220 degrees temperature, drier is 9½ feet in diameter and 28 feet long**

Steel Houses In England

Recent British housing developments include use of steel framework, window frames, doors, staircases, internal partitions as well as standardized steel roof and floor sections

■ A BLOCK of demonstration apartments recently completed at Battlebridge road, King's Cross London was designed and built as a contribution to technical research on housing construction and to culminate researches carried on since 1933. The apartments, shown in Fig. 1, were built under supervision of the British Steelwork association and include many items of interest.

Here new sheet steel unit sections received their first actual application and demonstrated their efficiency under actual conditions of use. The project indicates the new units and methods have considerable future possibilities.

Although limited size of the available site confined the building to a 2-story, 4 apartment (three of 2-bedroom and one of 3-bedroom size) structure, the design could be used without any material change for blocks four or five stories in height containing 20 to 100 flats with from one to four bedrooms each. Internal staircases serve two flats only per floor. Each apartment is planned around a central hall-passage giving separate access to all rooms. Kitchen and bathroom fixtures are arranged to form a standard twin unit at uniform vertical and horizontal intervals throughout the block, giving maximum economy in plumbing.

Standardization to eliminate unnecessary variation and to reduce costs as well as to improve construction efficiency is regarded as most important in a project of this type as proper choice of structural principles, methods and materials offers many advantages in mass production, pre-fabrication, bulked orders, rapid assembly and simplified organization on the job. Methods used here include following procedure:

Fig. 1 — Two-story apartment utilizing standardized steel sections for roofs and floors has pleasing modernistic appearance. Front eaves and downspouts are porcelain enameled

Steel framework arranged in rectangular bays of standardized dimensions is rapidly erected as soon as the building site is cleared and foundation bases prepared. This method makes possible simultaneous erection of other components on all floor levels and permits the roof to be put up immediately so wet weather cannot interfere with subsequent operations. All connections were bolted.

Although the use of rolled steel sections for framework of buildings is widely adopted, its value

Fig. 2—Steel staircase under construction, built from flights fabricated in the shop and attached to steel frame of building

IN STEEL!

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COLUMBIA STEEL COMPANY, *San Francisco*

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United States Steel Products Company, New York, *Export Distributors*

USS

UNITED STATES STEEL

in the construction of apartments of this type is not yet fully realized. However, the wide variety of other sheet steel components incorporated in these apartments form the most interesting features of the building. It is the essential material used for the whole of the staircase and landings, intermediate floor and roof. The flooring units in particular are the result of wide research on the application of spot welding technique to light dovetail-corrugated sheet. The same dovetail material proved ideal for the "floating" over-floors which tests have shown to be the best means of sound-proofing successive stories.

Staircases utilize steel treads, risers and strings. Each flight is shop fabricated and is connected to the steel frame of the building. Erected right after the frame, normally at a rate of a floor a day,

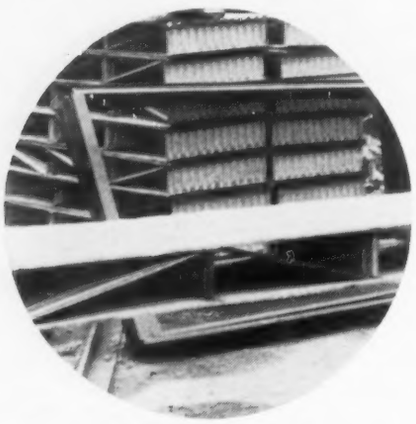

Fig. 4—Roof section showing vertical and diagonal reinforcing members. It is easily handled and positioned by two men

the stairs are ready for immediate use during construction of remainder of building. When interiors are finished, a granolithic cement for the treads is applied along with a coat of paint for the sheet steel balustrade. Fig. 2 shows stair in process of construction.

Floors are made up of spot-welded cellular units, shown in Fig. 3, each 2 feet wide and 12 feet (the room span) long. The units rest at their ends on the steel frame. No fixing connections are required so sound-deadening asbestos strips can be interposed to separate acoustically the floor structure from the supporting frame. Weighing only 96 pounds, two men can easily handle and position the unit. Floor is completed at a later stage by running in narrow stiffening ribs of concrete and floating on a top surface of cement screed. When finished, this structure weighs only 21 pounds per square foot compared to 45 pounds per square foot for a reinforced concrete floor of equal strength.

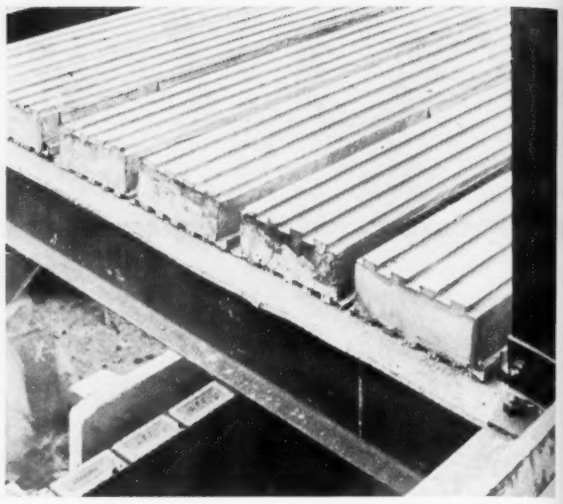

Fig. 3—Floor units with ends closed for concreting and resting on acoustic insulation strips

Although this would be adequate for many purposes, a "floating" over-floor was added to reduce transmission of sound from floor to floor to a minimum. The floating floor consists of a single layer of screed (cement) covered dovetail steel sheet which rests on timber battens laid on asbestos strips and insulated all around against the partitions by additional asbestos strips to give a discontinuity of construction.

The type of hollow sheet steel unit used for the roof is stiffened internally by vertical and diagonal members as shown in Fig. 4 and requires no concrete ribs. Units are joined together at the sides providing a continuous 4½-inch air space for thermal insulation. Units are cantilevered over the walls to form eaves. This construction lends itself to any desired type of flat-roof finish. Ruberoid roofing formed the final waterproof skin.

Upon completion of floors and roof, work on walls and partitions proceeded simultaneously on all floors. Since the frame carries structural loads, the outer walls can be of the lightest cavity construction adequate for stability, insulation and weather resistance. A half-brick wall was chosen here because it was inexpensive, durable and required no periodic re-decoration. For partitions and inner section of outer walls, a dovetail steel sheeting similar to that used for floor and roof was used. Rapidly erected in prefabricated units, this steel wall is exceedingly strong and provides a good key for plastic finishes in its dovetail surface.

Pressed steel door frames and window sub-frames were prefabricated as complete units incorporating lugs and straps. The same pressing which forms the actual window frame also forms the internal sill, jambs and soffit of the window

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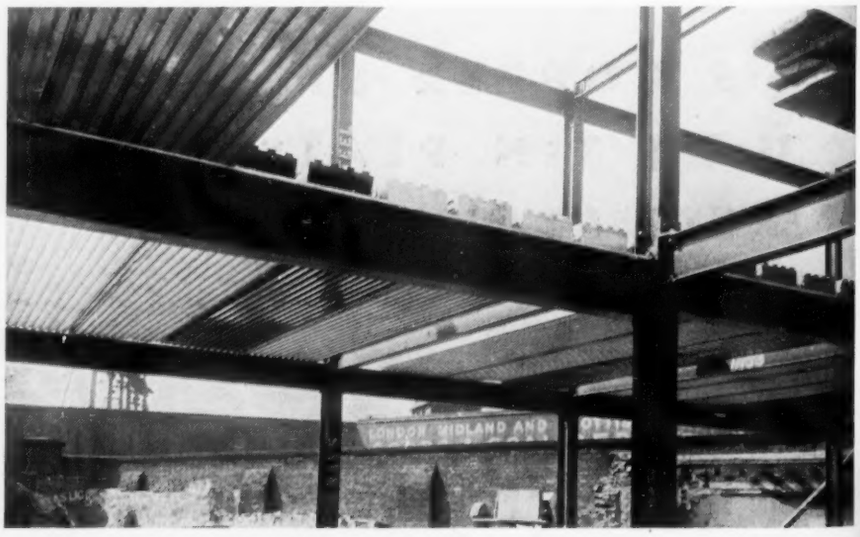

Fig. 5—Under side of floor units showing dovetail corrugations which securely lock plaster finishing coats

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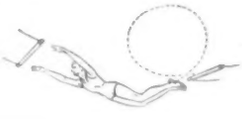
W-20E—FOR HIGH SPEED
Straight Polarity, D-c, or A-c

WE'RE really enthusiastic in offering you these new electrodes. Why? Because we know that you'll heartily agree – after you've tried them – that they give **better** and **faster** results than you've ever had before.

They're designed for all-position welding.  They handle easily.

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and the hard electrode coating is not easily chipped or damaged by moisture.

We're certain that when you've tried these new electrodes, you'll insist on them. Ask for a sample – TODAY – from your nearest G-E distributor or sales office. Or, if you prefer, fill out the coupon and send it to General Electric Company, Schenectady, N. Y.

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Please send me samples of the two new G-E extruded electrodes, W-20E and W-22E.

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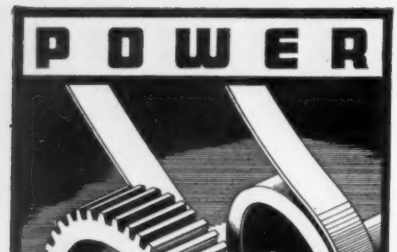


Steam-Engine Power

Power surveys in tin plate, steel and iron plants show power costs reduced to 0.552, 0.201 and 0.438 cents per equivalent kilowatt-hour by use of steam-engine drives

By **F. J. VONACHEN**
Mechanical Engineer
Troy Engine & Machine Co.
Troy, Pa.

■ IN A STUDY of the use of steam engines, 44 power cost surveys recently were completed in 43 leading concerns and institutions in 29 different fields involving 19 different types of driven machines. The data, which were checked carefully, revealed that average power cost in the 43 plants was ½-cent per kilowatt hour; many were ¼ and 1/3-cent, while one was as low as 1/10-cent per kilowatt-hour. In 24 cases where comparative power costs were available, average investment was $1100, annual savings $1600, and average annual return on the investment 114 per cent. Power costs were reduced 71 per cent.

These results show how easily low power costs can be obtained if the plant is surveyed properly and the correct equipment is installed.

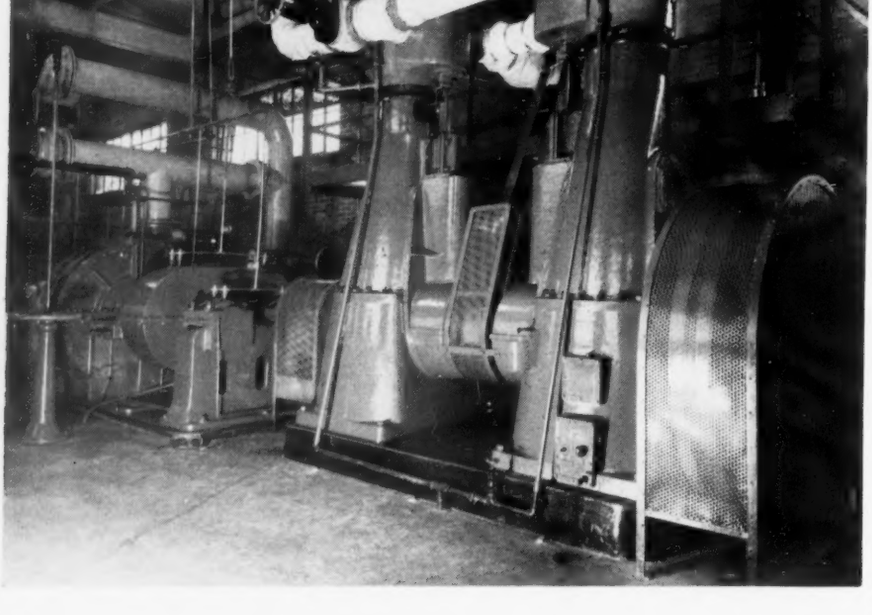
Examples taken from the iron and steel industry are shown in the accompanying tabulation of surveys made at the Washington Tin Plate Co., Washington, Pa., a large iron company in the Middle West, and a steel plant in the East.

When steam is needed for heating or processing, the engine definitely fits into the picture as it produces and maintains low-cost power for various machines such as stokers, forced and induced draft fans, generators, compressors, ventilating fans, blowers, exhausters, dryers, conveyors, and similar equipment. Note, however, the low power cost shown in the survey at the Washington Tin Plate Co., ½-cent per kilowatt-hour, where none of the exhaust steam is utilized.

Steam Power Low

Steam at 80 to 150 pounds and higher pressures is generated by a boiler at only slightly greater cost than at low pressures since most of the heat in a boiler is used to change the water into steam. The additional amount of heat necessary to raise the pressure is relatively small. This steam can be put through the steam-engine cylinder, which serves as a reducing valve, to generate power and, depending on actual steam conditions, approximately 90 per cent of the heat in the initial steam will be present in the exhaust for heating or processing. Thus the steam does double duty; first, passing through the engine it generates power; second, it retains approximately 90 per cent of the heat in the exhaust for heating and processing purposes.

Cost of generating this by-product power consists of operating and fixed costs. Operating costs are about 10 per cent of the steam cost (the other 90 per cent of the steam cost being rightfully charged to



Duplex engine drive on blower in iron company's plant produces power at equivalent cost of 0.201 cents per kilowatt-hour

Engine-Driven Centrifugal Dryer

Survey Data

Location	Eastern steel plant
Engine	6 x 6
Brake horsepower at 200 r.p.m.	8
Hours operation per year	5000
Steam pressure saturated lbs.	126-160
Back pressure lbs.	15
Feed water temperature deg. F.	210
Cost of steam—evaporation of 8 lbs. of water per lb of coal at coal cost of	$3 per ton
Cost of engine installed	$915
Extra labor to operate engine	none
Part of engine exhaust used for heating and processing, per cent	100

Annual Engine Cost

Depreciation—5% of $915	$45.75
Average interest at 6%—$915 x 0.0315	28.82
Maintenance—2% of $915	18.30
Steam consumption for load of 8 b.h.p. is 448 lbs per hour.	
Heat left in exhaust per cent	92.5
Heat chargeable, per cent	7.5
Steam cost chargeable to engine	31.50
Lubrication cost	30.00
Extra labor	00.00
Total	$154.37

Power Cost at Dryer Shaft

For 35,200 kw. hr.* is: 0.438 cents per kw. hr.

heating cost), and lubrication cost. Fixed costs, based on 20-year life, are: Interest on investment, at 6 per cent; annual depreciation, 5 per cent; annual maintenance, 2 per

Engine-Driven Blower

Survey Data

Location	Middle Western iron plant
Engine	14 x 14 duplex
B.h.p.	360 at 282 r.p.m.
Hours operation per year	8640
Steam pressure lbs.	125
Superheat deg. F.	0
Back pressure lbs.	8
Feed water temperature deg. F.	200
Cost of steam	13 cents per 1000 lbs.
Cost of engine installed	$8775
Extra labor to operate engine	none
Purchased current cost, including demand charges	1.2 cents per kw. hr.
Part of engine exhaust used for heating and processing, per cent	70

Annual Engine Cost

Depreciation—5% of $8775	$ 438.75
Average interest at 6%— $8775 x 0.0315	276.42
Maintenance—2% of $8775	175.50
Steam consumption, load of 360 b.h.p., 10,880 lbs. per hour.	
Heat in exhaust, per cent	88.5
Heat used by engine, per cent	11.5
Steam cost chargeable to engine	4034.00
Lubrication cost	140.30
Extra labor	00.00
Total	$5064.97

Power Cost at Blower Shaft

For 2,520,000 kw. hr.* is: 0.201 cents per kw. hr.

cent, which is ample as maintenance is small. In spite of numerous items in the cost, the total is so low that steam engines usually pay for themselves in 6 to 12 months by the savings in power cost. Some of the plants require exhaust steam that is free from cylinder oil. Many steam engines are being operated satisfactorily today without oil cylinder lubrication. With the cylinder properly constructed and glazed by the use of beeswax and graphite (a method that has been used for years in the highly critical marine field as well as the stationary field), it may be operated without any lubrication except possibly the introduction of a slight amount of beeswax and graphite at infrequent intervals. A solution of colloidal graphite in distilled water, introduced into the cylinder by a special mechanical cylinder lubricator, also is used with excellent success.

Since the water rate (steam rate) of the steam engine remains low throughout the entire speed range and even at high back pressure, there is no limit to the amount of back pressure if there is sufficient initial pressure to produce the required power within the limits of practical cylinder bores. As this low water rate is maintained closely throughout the life of the steam engine, original plant heat balance also is maintained.

The modern steam engine is suitable for a wide range of steam conditions from 20 to 400 pounds initial gage pressure, from extremely wet steam to 750 degree Fahr. total temperature, from vacuum to 75 pounds and higher back pressure. The engine is not damaged by the usual chemical impurities in steam.

Flexibility, accurate control, economy and reliability, all are essential factors which are met by the modern steam engine. In variable speed service, it has a wide, smooth, speed range easily adjustable, by infinitely small steps. It is well adapted to automatic control. Whether the control is manual or automatic, definite speed is maintained for each point of control. In other words, the modern steam engine has good

Engine-Driven Forced-Draft Fan

Survey Data

Location—Washington Tin Plate Co., Washington, Pa.	
Engine	7 x 7
Maximum B.h.p., at 325 r.p.m.	30
Average B.h.p., at 150 r.p.m.	15
Hours operation per year	8700
Steam pressure lbs.	150
Superheat deg. F.	15-25
Back pressure lbs.	1-5
Feed water temperature deg. F.	212
Cost of steam is 8.5 lbs. of steam per lb. of coal at	$1.60 per ton
Cost of engine installed	$971
Extra labor to operate engine	none
Part of engine exhaust used for heating and processing	none

Annual Engine Cost

Depreciation 5% of $971	$ 48.55
Average interest at 6%—$971 x 0.0315	30.59
Maintenance—2% of $971	19.42
Steam consumption for average load of 15 b.h.p. is	576 lbs. per hour
Steam chargeable to engine	472.00
Lubrication cost	60.50
Extra labor	00.00
Total	$631.06

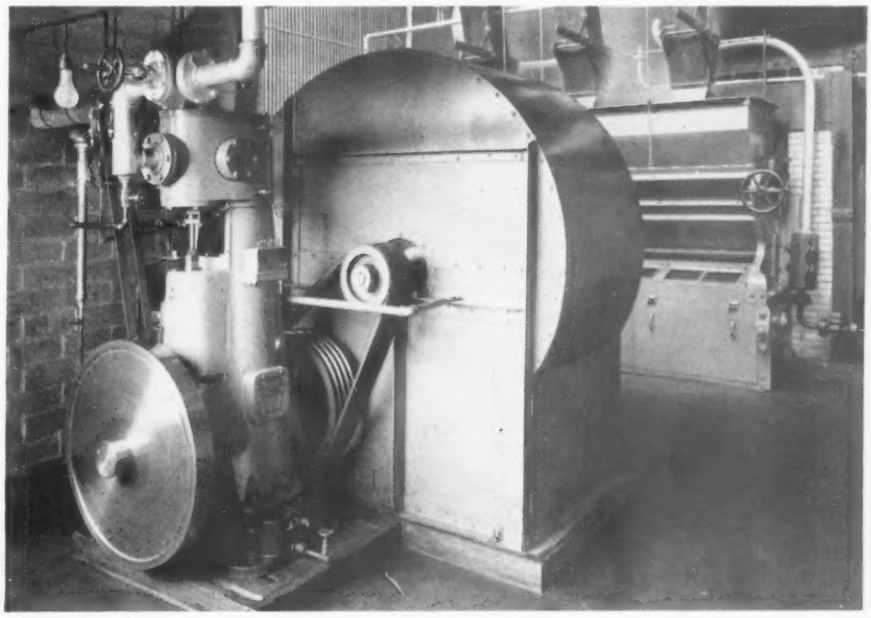
Power Cost at Fan Shaft

For 114,700 kw. hr.* is: 0.552 cents per kw. hr.

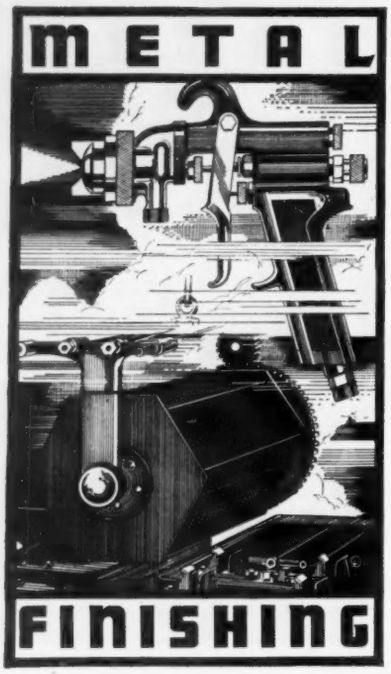
*This is the equivalent electrical power in kilowatt hours that would have been supplied to a motor drive. The above cost should be compared only to the purchased power rate plus motor fixed charges and other operating cost.

regulation and, of prime importance, no hunting. Constant-speed engines, such as those driving generators, use the automatic governor which gives regulation within 2 per cent from no load to full load. Steam engines also are quickly started, as little warming-up is re-

(*Please turn to Page* 66)



Engine-driven forced-draft fan in tinplate mill operates at equivalent cost of power of 0.552 cents per kilowatt hour



Bright Zinc Plating

One of the newer plating processes, its use with modern plating equipment and procedure described here produces an excellent finish at low cost. Only one operator is required

By R. L. Douglas
Russell, Burdsall, & Ward Bolt & Nut Co., Coraopolis, Pa.

■ SEVERAL MONTHS ago the Coraopolis, Pa., plant of Russell, Burdsall, & Ward Bolt & Nut Co., Port Chester, N. Y., installed a new system of zinc plating to supplant cadmium plating equipment formerly used. This plant manufactures nuts exclusively so it was a relatively simple matter to lay out a system to take care of this one product. The new equipment consists of a vapor degreasing machine, a pickling system and a three barrel multiple plating unit.

Cadmium plating was formerly done in three oblique wooden barrels from which the solution was pumped to a storage tank each time the plated work was removed. Solution was pumped back into the barrels when a fresh charge was made. Due to the inefficiency of this method and the increased cost of cadmium, the company decided to change over to the new bright zinc plating process.

Developed by the Grasselli Chemical division of E. I. duPont de Nemours Co. and produced under the trade name "Zin-O-Lyte", the zinc finish obtained is a bright one, somewhat duller than chromium or nickel but far brighter than cadmium. Average thickness of plate is about 0.00025 inch.

Plating unit and rinse tanks are standard units manufactured by Lasalco Inc., St. Louis. Barrels in this unit are made of mica impregnated hard rubber. The generator with a capacity of 1000 amperes at 6 volts is located in a separate room a short distance away from the plating tub. The plating tank itself is fitted with two large cooling coils tnrough which cold water is circulated constantly. These cooling coils control the temperature of the plating solution sufficiently and eliminate removing solution from the tank to cool it.

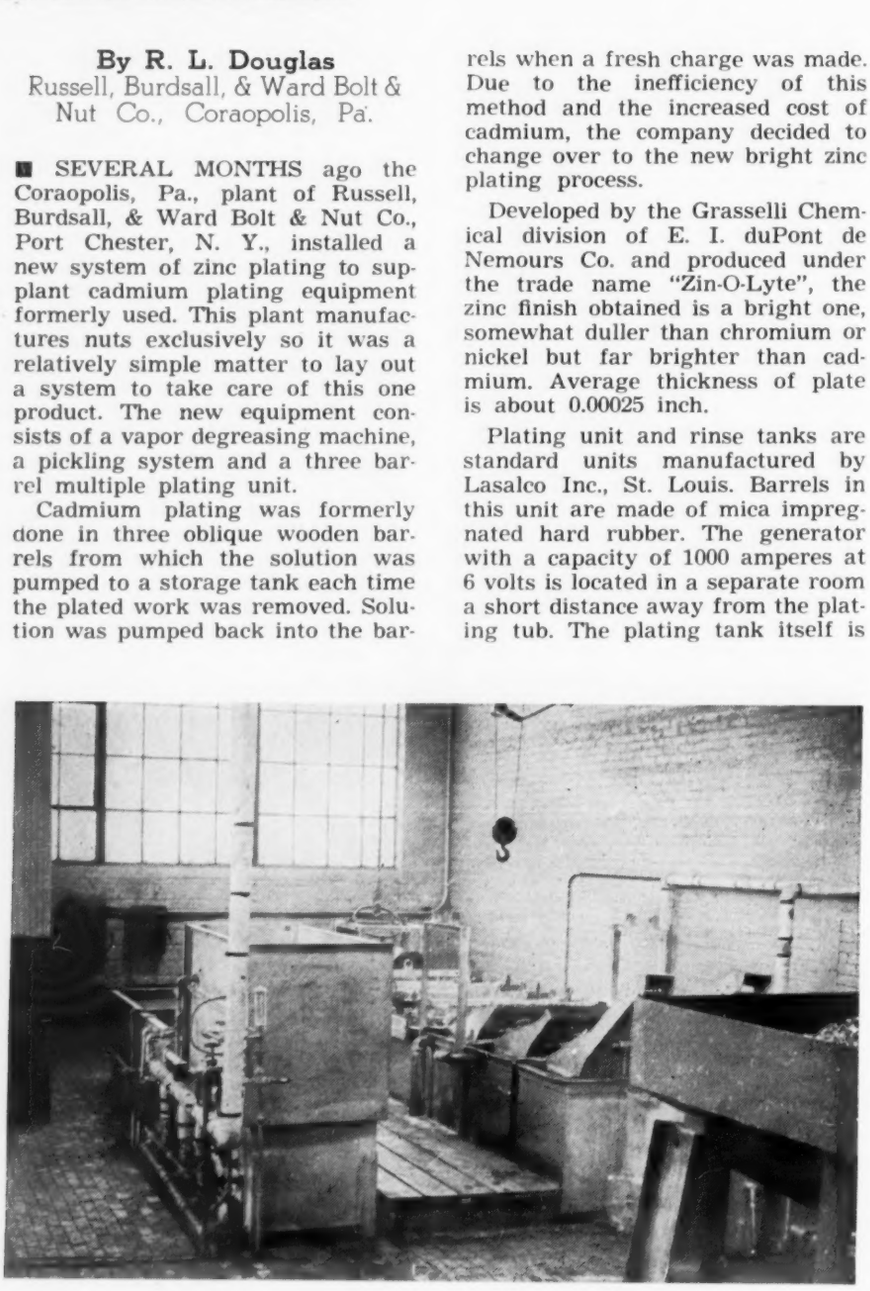
Uses Degreaser

A degreaser, manufactured by the G. S. Blakeslee Co., Chicago, is used to clean the material to be plated. Material as it comes from production machines is covered with a film of oil which acts as a rust preventive. Nuts are not oxidized or discolored. The degreaser removes this oil completely and leaves a perfectly clean surface. Occasionally, however, the nuts are allowed to stand around the plant or in stock for some time before they are plated, and they sometimes become rusty because of this. Then the pickling system is used in conjunction with the degreaser to remove both rust and oil.

Considerable care is taken in the cleaning of the material before it is plated as a clean surface is of utmost importance if a good bright zinc plating job is to be obtained.

Two storage tanks and a still are used with the vapor degreasing machine for storage and for cleaning the dirty solvent. Solvent must be kept clean to insure efficient operation.

Work is handled in monel metal open mesh baskets in all operations prior to the actual plating and in plating barrels and hoppers through the balance of the process. Work is



General view of plating department with degreaser in foreground and plating tanks against the right hand wall

Metal parts for these famous machines are cleaned with ORTHOSIL

TRADE MARK

L C SMITH & CORONA TYPEWRITERS INC. is a firm that has long been known for typewriters and office machines accurately built and handsomely finished. In the exacting manufacturing operations of the Groton Plant of this company, an important problem is the effective cleaning of steel parts prior to finishing. Heavy coatings of cutting oils had to be removed rapidly, completely—and economically.

For this purpose, Orthosil was selected as the metal cleaner. Not only did it prove its speed and thoroughness in removing grease and oil, but it substantially reduced the cost of the alkaline cleaning operations. A far smaller quantity of Orthosil is needed to do a better job.

This has been the experience of many leading manufacturers when they change to Orthosil. The advantages of this product are definite, and can be demonstrated in your plant. Why not try Orthosil, and check it against other alkaline cleaners? Write for full details. Address Department F.

PENNSYLVANIA SALT MANUFACTURING CO. · Est. 1850
Widener Bldg., Philadelphia, Pa.
New York · Chicago · St. Louis · Pittsburgh · Tacoma · Wyandotte

- Particularly effective in electrolytic cleaning due to its high conductivity
- Assures quicker action than other alkalis
- Prevents grease and dirt from re-depositing
- Easy to pour, quick to dissolve
- Dry—highly concentrated—economical
- Quickly removes the grease, soot, dust and various other kinds of dirt unaffected by pickling acid
- Leaves material *clean* for further processing

PENNSYLVANIA SALT *Chemicals*

introduced into the system through two bins which are loaded by large buckets carrying nuts from the production machines. Bins are equipped with small hoppers. Operator lowers handle of hopper untill he has sufficient material in the monel metal cleaning basket which rests on a roll conveyor. Work stays in the cleaning basket as it goes through the degreaser and pickling system. Then it is transferred from this basket to the plating barrel by means of a special transfer rack.

After plating, work is removed from the barrel and dumped into the first rinse tank hopper which contains cold water. From there it is dumped into a second cold water rinse tank. Water in both these tanks is being changed constantly. Work progresses from the second rinse tank into the third which contains water heated to about 190 degrees Fahr. Water here is not circulated.

Hopper Is Longer

This third rinse tank is equipped with a hopper which is different from the first two in that it is longer and is divided to shoot the nuts into two centrifugal dryers which are located at the end of these rinse tanks. After work has dried, it is lifted by hand in the small baskets which are an integral part of the dryers and placed in wooden shipping kegs.

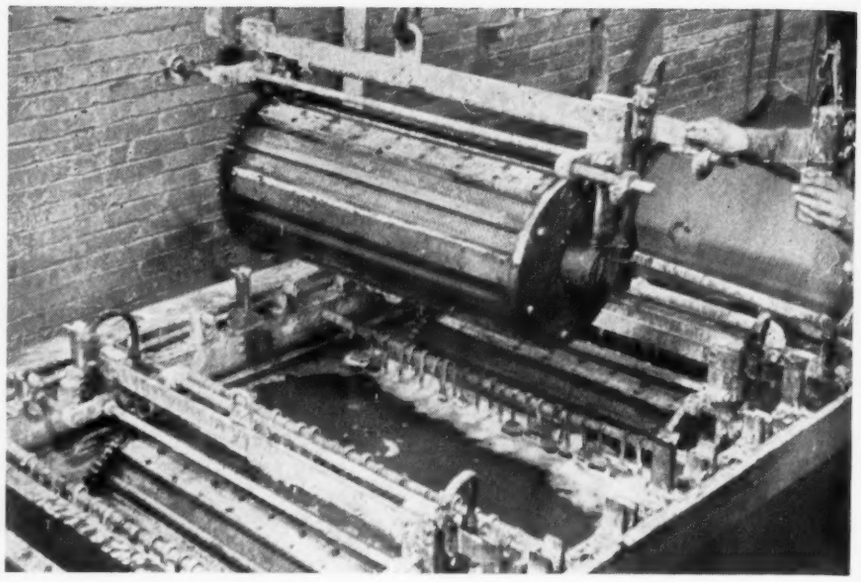
It will be noted that this is the only operation in the system where the work is handled by hand. In all other operations a small electric hoist is used. This hoist has an electric lifting motor and a small auxiliary motor which moves it along the track. This motor drives through a rubber tire mounted so that it contacts the bottom of the monorail giving a high coefficient of friction and reducing slippage to a minimum. All controls for the hoist are centrally located at a 4-contact pushbutton station which hangs within reach of operator.

A control laboratory was constructed in the plating department to be used in conjunction with this system and as a general control laboratory for the entire plant. Here thickness of plate and condition of pickling and plating solutions are checked.

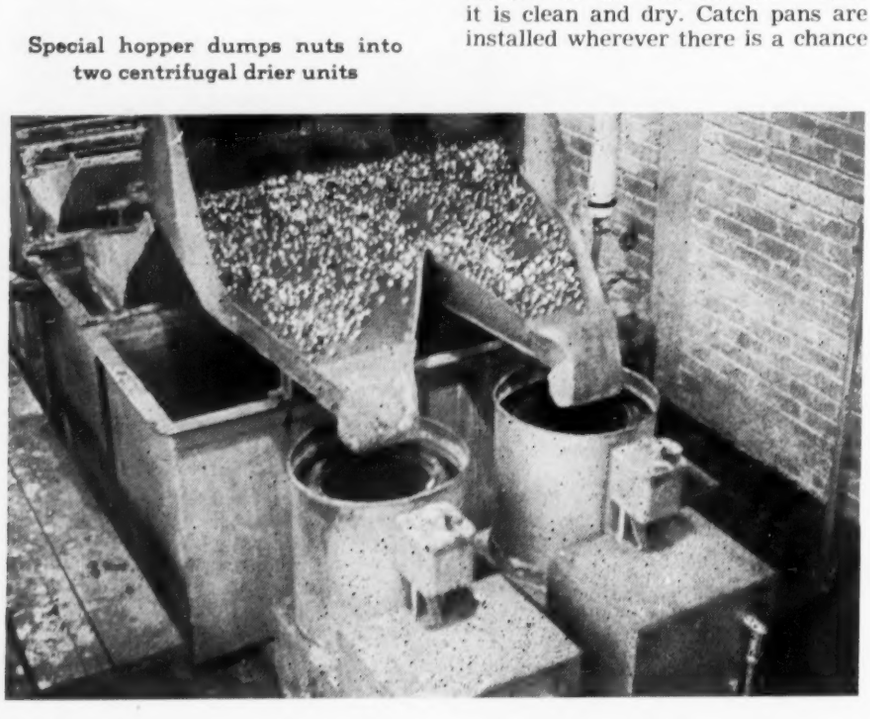
All equipment in this plating system is of standard design and construction resulting in lower first cost. In addition repair parts are less expensive and easier to obtain since they are carried in stock by the manufacturer.

Perhaps the most outstanding feature of this installation is that it is clean and dry. Catch pans are installed wherever there is a chance for any liquid to get on the floor. As a consequence, the floor is always dry. There are no duckboard walks. Floor is made of wood blocks. Entire room is painted with aluminum paint, making it light and clean, preventing corrosion from fumes and moisture.

Because of the efficient layout, one operator is able to do all the work in this department which, combined with the low operating cost, makes this an inexpensive layout as well as a good one.



Plating barrel being lifted from the plating tank by overhead hoist which runs on a monorail. Push buttons hang at convenient level in front of operator



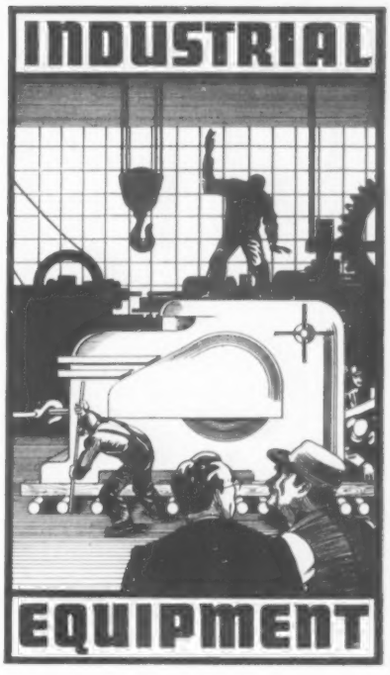
Special hopper dumps nuts into two centrifugal drier units

New Ripple Finish Has Metallic Sparkle

■ Hilo Varnish Corp., 42 Stewart avenue, Brooklyn, N. Y., has developed a new finish known as Sparkle Rip-pls. Chief characteristic is brilliance and life obtained by adding a metallic sparkle to the wave line effect of standard Hilo Fine Gloss Rip-pls.

Sparkle Rip-pls may be used on any non-porous surface and finds application on such equipment as air conditioning units, automobile heaters, typewriters, adding machines, toys, etc. The finish is said to be proof against alcohol, grease, moisture and oil.

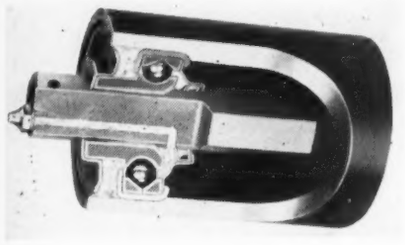
Material is prepared for each day's work by mixing a bronze powder with the color of ripple material desired and thinning with a reducer, after which it is applied by spraying on a full coat. Then it is baked for 1½ hours at 200 or 225 degrees Fahr., depending upon the color involved. Colors available include light jade green, pale ivory, gray, red, black, green and brown.



Protected Bearings to Keep Out Dirt and Grit

■ Standard Conveyor Co., North St. Paul, Minn., has introduced protected bearings for use in foundries and in other places where dirt and grit are problems.

This design includes an added inner shield, the inner part of which is stationary, and with a hexagon hole fitted snuggly on the shaft. With this setup grease is maintained longer and greasing is done through the back of the bearing. By placing the opening at the outside of the shield instead of close to the inner race, momentum of the rollers will carry the dirt outward and throw it away from the roller.

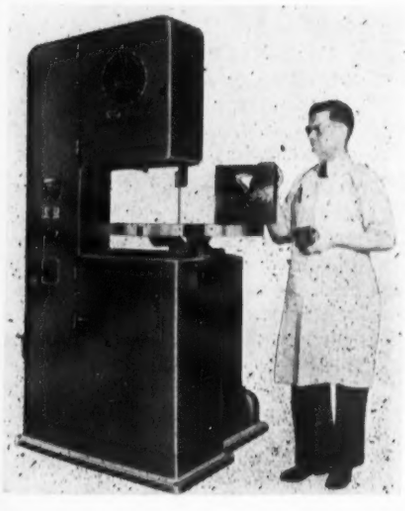


Machine Features Wider Throat Capacity

■ Continental Machine Specialties Inc., 1301 Washington avenue, Minneapolis, has placed on the market a new model of the Doall contour machine which has a 16-inch throat capacity and two ranges of limitless variable speed.

The machine is of heavy welded steel construction and incorporates a built-in automatic butt welder and 4-way table tilt. When filing, the unit has a 2-piece file backing member which makes it unnecessary to remove anything for internal filing operation.

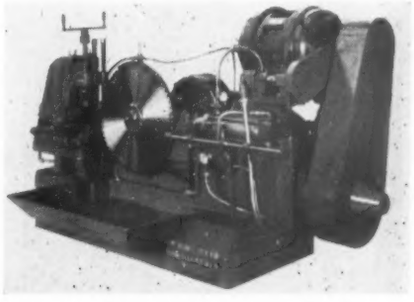
Lower range of speed of machine is from 75 to 450 feet per minute. The upper range is from 450 to 2800 feet per minute. A job selector conveniently located on the unit gives the correct speed to use on such jobs as sawing, filing or polishing.



Non Ferrous Billets Are Sawed Rapidly

■ Cochrane-Bly Co., Rochester, N. Y., has introduced a machine for sawing billets, tubes and bars of aluminum, brass and other nonferrous alloys up to 9 inches in diameter.

It is driven through a double multiple, disk clutch and hardened alloy steel gears, hardened steel worm and phosphor bronze worm gears all running in oil. All drive shafts, including the saw spindle, are mounted in antifriction roller bearings. Sliding gear transmission of the unit provides four speeds of approximately 250, 370, 485 and 600 feet per minute. Material is fed by a hydraulically controlled feed from 0 to 100 inches per minute. Adjustable stops in both directions govern the automatic trip and rapid return traverse of the carriage.



A saw blade, 30 inches in diameter, which is capable of cutting 7-inch aluminum bars in five seconds, is part of the standard equipment together with a large chip pan with sloping sides to take care of the accumulation of chips.

Heavy steel feed trough receives the billets from the crane or loading table, and a chain and sprocket operated truck under the trough feeds the billet into the machine to cutting position. The unit occupies a floor space of 64 x 114¼ inches and weighs 9500 pounds.

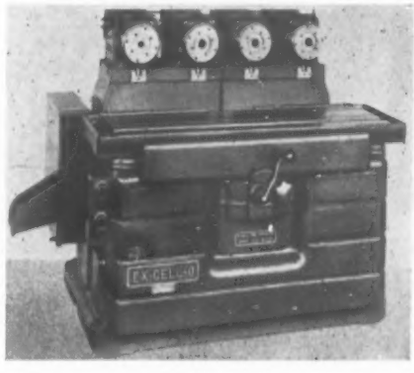
Spindles Placed Right Angle to Table Travel

■ Ex-Cell-O Corp., Detroit, Mich., has added to its line of precision equipment a machine for facing, turning and grooving operations, spindle units of which are placed at right angles to the work table travel.

This machine is mechanically similar to the other precision machines excepting for the work table setup. The work table traverse is operated and controlled by a hydraulic cylinder. Adjustable dogs located on the front of the table and covered by a guard automatically control the traverse, location and length of table feed.

Parts can be rotated by the spindles or held stationary on the table. An adapter, arbor, hand or air operated chuck can be used to clamp the part to the spindle nose. A manually or hydraulically operated fixture can be used for mounting the work on the table.

Between the 15½ x 50-inch table and bridges is a chip chute that may be arranged to direct chips to either side of the machine. For jobs requiring coolant, a reservoir is cast in the machine base and a pump and can be driven by the main motor. For dry operations, a suction system can be installed.



Click-Boxes Eliminated From Service Planers

■ G. A. Gray Co., 3611 Woodburn avenue, Cincinnati, has placed on

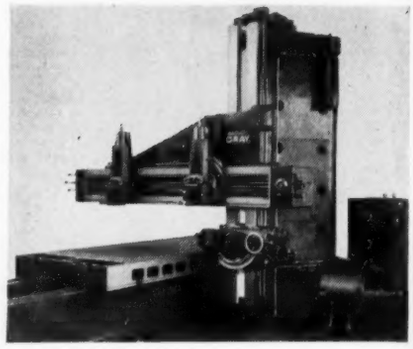
the market a new line of openside and double housing service planers, featuring improvements which allow inexperienced workers to operate them with little trouble.

Click-boxes are eliminated, and a control actuated by a lever makes possible to engage or disengage feed, or to rapid traverse the heads in either direction. The elimination of coasting after the heads make a rapid traverse permits the operator to place them practically to a line.

Operating levers are so located as to concentrate control at the tool point. Feed and rapid traverse are so interconnected that it is impossible to engage both the feed and traverse of any one head at the same time.

By using the same lever that engages the drive mechanism to start the motor, the supplementary pendant switch station has also been done away with. The feed dial and control knob has been moved from the end of the rail to the front face of the rail. All feed and traverse parts are enclosed in a dust-tight case and run in oil.

Extended saddles on all heads provide an additional long-leverage bolt circle, stiffening the harps and making possible the use of two extra clamping bolts. An additional feature is the automatic rail leveling. This enables the rail, after it is lowered, to be automatically raised a fraction of an inch so that all backlash in the elevating mechanism is removed and the rail leveled before being clamped.



Overhead Trolley to Convey Light Loads

■ Mathews Conveyer Co., Ellwood City, Pa., has placed on the market a light-duty, all-purpose, antifriction trolley suitable for use with the endless, chain power operated type trolley conveyors, or as individual trolleys manually operated.

The outer shell is made of ⅛-inch thick steel, case hardened. The ball bearing incorporates a seal composed of a steel and felt labyrinth. Bearings are self contained and are furnished grease-packed or without lubrication. Inner and outer ball races are of solid steel, 3-point contact, enclosed within a steel jacket. These trolleys have a capacity of 150 pounds, and are suitable for handling numerous commodities through processing and manufacture.

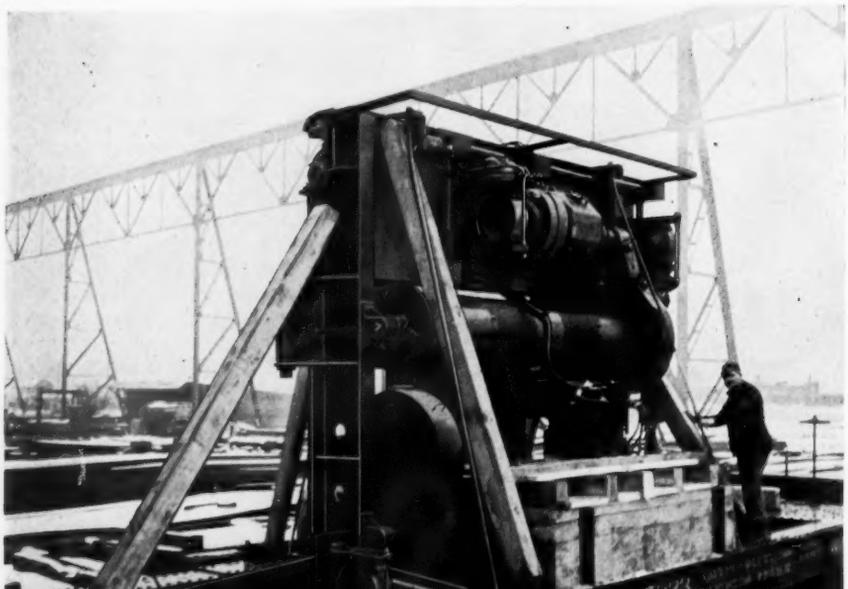
Sweeper Has Own Power Plant

■ Foote Co. Inc., Nunda, N. Y., has placed on the market a sweeper of the combined brush and vacuum type which travels under its own power and is guided in the manner of a lawn mower.

The unit is capable of sweeping wet or dry, completely removing dirt from the area being cleaned and passing it on to containers. Wall and curb brushes are also provided, the former can be attached to a suitable outlet and used for cleaning under machinery or furniture, while the latter is suitable for working close to baseboards. All controls are on the handle bars at the finger tips of the operator. Either gasoline or electric power is available.

CLEVELAND CRANES

All Welded for Every Industry



● It was necessary to ship this one piece 30 ton, 12 foot spread trolley in a "well car" in order to meet railroad clearance requirements. Just one of the many special problems involved in giving our customers the low operating costs of one piece units.

ALSO BUILDERS OF CLEVELAND TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO

1125 Depot St.

WICKLIFFE, OHIO

NEW YORK • DETROIT PITTSBURGH • CHICAGO

MATERIALS HANDLING EQUIPMENT

Interplant Shipping

(*Concluded from Page* 50)

parts occupied space uneconomically; were sometimes damaged, and were difficult to unload as shown in Fig. 7.

The present unit-load method of

Fig. 7—This shows former method of shipping knock-down crates

handling such refrigerator accessories utilizes double-faced pallets as well as band-iron features. The knock-down crates, shipping supports, and miscellaneous hardware shown in Fig. 7 are now prepared as unit-load packages with the aid of pallets similar to those shown in Fig. 6.

Hooks for suspending motors from the ceiling are now compactly

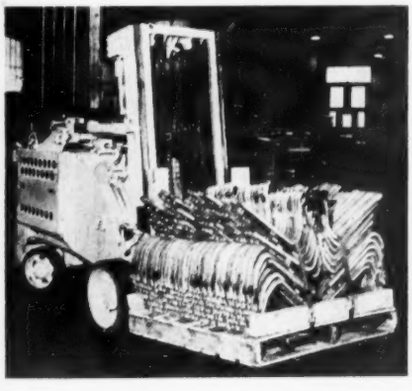


Fig. 8—Hooks as packed in the modern way, strapped in unit loads on pallets, with electric fork lift truck to do the hauling

handled as shown in Fig. 8, and can be loaded and unloaded with fork-trucks. This is a great improvement over the former haphazard shipping system.

Steel Houses

(*Concluded from Page* 56)

opening. Windows themselves are steel casements of various sizes and fitting arrangements.

Entrance doors and some others are composed of two flush sheet surfaces on a core of light steel framing. Other doors are made of flush plywood on a wood core faced with thin steel sheet.

To show the adaptability of dovetail steel sheeting, a number of different finishings have been applied to ceilings, walls and floors, including painted steel sheet in various standard pressed panel separated from the structural floor or roof by an air space to provide additional sound and thermal insulation. Plaster board finished with a skim-coat of plaster and specially sound-proofed ceilings of acoustic asbestos also are used. Normal 2-coat plaster decorated with various paint films is employed on many of the walls. Coved skirtings and several shapes of picture-rails of pressed steel are included.

Linoleum Adopted

A stout linoleum stuck down to the cement screeding is the floor covering generally adopted. Cork composition and colored asphalt are other methods utilized for certain floors.

Since Gas Light & Coke Co. provided the site and will take over the apartment as dwellings for its employes, the apartments have been arranged as an "all gas" demonstration utilizing switch controls on the lights to give the same convenience as with electricity. Gas plugs afford connections to irons and other portable equipment.

Several types of sanitary fittings were installed including porcelain enameled pressed steel sheet. Certain miscellaneous items show interesting applications of steel. Sheet steel rubbish chutes have a special apparatus for automatically closing the chute while emptying material into it. Rubbish bins and enclosures also are of steel sheet. Balcony railing consists of a mesh of steel tape on a frame of steel bars with a low skirting of steel sheet. Boundary fence at the edge of the sidewalk is steel wire on a tubular steel frame.

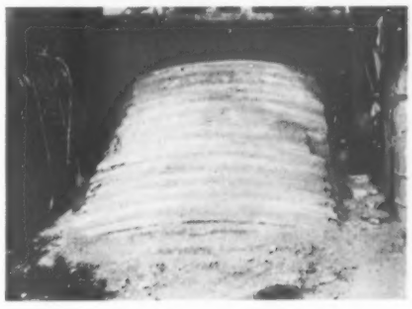
Gutters and down-spouts on the back of the building are galvanized steel while those on the front are porcelain enameled.

Auxiliary Slag Pocket

(*Concluded from Page* 44)

der the old method. Fuel consumption is reduced and operating efficiency of the furnace increased.

Crowe auxiliary slag pockets have



Crowe auxiliary slag pocket at work, here shown with roof on and in process of filling

been installed in a number of steel mills. This system can be installed on any open hearth furnace while the furnace is in use.

For all Purposes
LESCHEN WIRE ROPE
"HERCULES" (RED STRAND) WIRE ROPE
ESTABLISHED 1857
A. Leschen & Sons Rope Co.
5909 Kennerly Avenue
ST. LOUIS, MO.
New York · · · 87 to 90 West Street
Chicago · · · 810 W. Washington Blvd.
Denver · · · · · 1554 Wazee Street
San Francisco · · · · 520 Fourth Street
Round Strand
Flattened Strand "P. F. S."
Non-Rotating
Preformed
Steel Clad
Locked Coil
Regular Lay
Lang's Lay
Hemp Center
Wire Rope Center
Metallic Core
Seale - Filler Wire
Warrington

Steam Engine Power

(*Concluded from Page* 59)

quired, and therefore, can be placed in service quickly.

As to reliability, the modern heavy-duty steam engine is of rugged construction, has been continuously improved and is fully enclosed, self-oiling and oil-tight so it is quite common to have months of 24-hour continuous service at full load without a single shutdown.

Its speed is conservative and conducive to long life. Compressors, fans, blowers, exhausters and generators may be direct connected. Only a small speed reduction is necessary to drive stokers and conveyors. Higher speed fans, blowers and dryers may be connected through flat or V-belts, or chains. Its high starting and running torque and large overload capacity are desirable features for most installations.

Planning Group Drives for Installation and Operation

■ ALL LINESHAFTS in one metalworking plant are laid out parallel and fairly close together. Installing in this way permits belting across and driving two shafts from one motor in case the motor to one line should fail. In some cases in periods of peak production when all machines are in operation, a few of the less important machines may be permitted to remain idle to prevent a serious overload on the motor.

The motors to the various lineshaft groups are rated higher than necessary for the actual load on each individual group to permit this cross belting. For example, each group is lined up to require from 7 to 8 horsepower, but, the groups are driven by 10-horsepower motors. This provides a surplus in motor capacity which will handle the overload of the two shafts by watching it carefully to prevent overheating. In practically every instance the new motor is installed during the night so that the excess load is carried for only a few hours at a time.

This arrangement has similar application in times of low production, when two shafts are belted together and operated from a single motor. Ordinarily only a few machines are operated in each group during slack periods. Therefore, the one motor easily handles both groups. Antifriction bearings on the lineshaft reduces starting and operating loads and all machines are operated through clutches or loose pulleys, thus further reducing the starting load so that a single motor is able to start with the two shafts.

Extra pulleys are kept installed on the lineshafts and belts are kept in the storeroom so that two shafts can be quickly and easily belted together. Fastenings are of the hinge and pin type.

Check for Overload

Whenever two lineshafts are coupled together graphic meter records are taken of power consumption to see that the motor is not too heavily overloaded. Similar tests are made frequently on individual lineshaft motors, especially when the materials worked on are changed in dimensions or composition, to check on the load.

Power factor correction is made by a synchronous motor driving the plating generator. This motor, the largest in the plant, is started first each morning, and the other motors are started in sequence to prevent building up an excessive demand at starting time.

Lineshaft hangers and countershafts are mounted on channels which are attached to the ceiling inserts with bolts and pipe spacers. The flanges of the channels are set with the flanges up thus leaving a flat support for the hangers. Slots are cut in the web of the channel for hanger adjustment. The open space between the channels and the ceiling, as provided with the pipe spacers, permit access to bolts.

This is an economical method of constructing superstructure for attaching lineshafts. However, when a shaft is moved, usually new slots must be cut in the channels to receive the hanger footings. In this plant each mainshaft hanger is mounted directly to its channel without using longitudinal channels. This places the shaft hangers 6 feet apart, the spacing of the ceiling inserts. For mounting countershafts a pair of channels, flange up, are bolted longitudinally to the channels attached to the ceiling inserts. Belts shifters, where no longitudinal channels are used, are fastened to an angle iron attached across to two channels mounted on the ceiling. Usually belt shifters are attached to the channels supporting the countershaft.

The larger machines and a few which are operated in isolated positions or at irregular periods are individually driven by motors mounted directly on the units. Most of these operate at low speeds and require either a geared-head motor or speed reducer in the drive.

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Safety in a certain plant requires that all drives on punch presses be entirely disconnected before changing punches and dies. In some cases on group driven units this required removing the belt. Drives were changed to connect through countershafts and the belt shifters are now tied in the off position when changing tools. This has simplified and speeded up tool changes.

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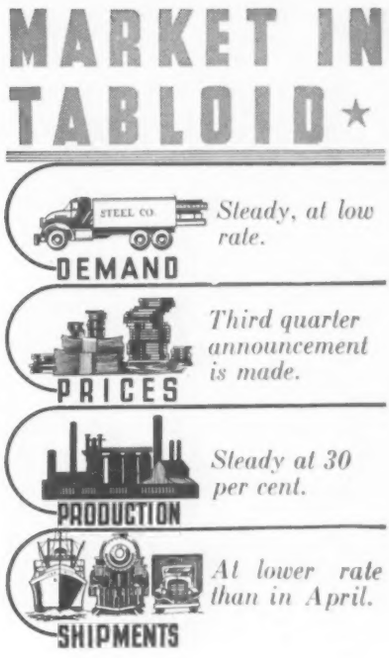
A safe plan is to paint the proper fuse rating inside the case or door to the fuse box and check any new fuses as installed. Remember the fuse is the safety valve on electric circuits and overfusing destroys the factor of safety.

Excavator Is Convertible

■ Built by Bucyrus-Erie Co., South Milwaukee, Wis., this 33-B 1¼-yard excavator has long caterpillar frames to reduce nosing when digging. Excavator is convertible for shovel, dragline, clamshell, crane or dragshell service. Diesel, gasoline or electric power units may be installed

Third Quarter Prices Hold at Current Level

Flat-Rolled Schedule Adjusted; Purchasing Shows No Gain



■ ANNOUNCEMENT of third quarter prices by Carnegie-Illinois Steel Corp. last week reaffirmed current quotations on all rolled products except flat-rolled. This removes one uncertainty from the situation.

In sheets and strip new prices are designed to correct inequalities that have grown up during development of continuous mills. New extras and deductions have been set up to simplify and unify prices for closely related products. These are to go into effect immediately and as application to second quarter base prices would cause an increase new bases have been named. The buyer has choice of the old base and extras or the new, whichever gives him the best delivered price, until June 30, when the new schedule will be in full effect.

Independent mills have not yet announced prices for third quarter but it is believed they will adopt the plan. An eastern producer of pig iron has reaffirmed its second quarter schedule for third quarter and similar action is expected generally.

Settlement of doubts as to prices is not expected to cause much additional buying. Results are not anticipated immediately and probably will await clearing of other factors.

With general buying showing few signs of improvement various lots of steel are developing to assist in keeping production at its present rate. A plant for the bureau of printing and engraving at Washington will require 8800 tons of structural steel. Four cargo boats for American Export Lines Inc., New York, on which bids have been opened, will consume about 16,000 tons of steel. Awards on these ships will be made by the maritime commission, with which the owning company has a contract for a number, four to be started this year. Chicago, Milwaukee, St. Paul & Pacific has undertaken construction of 464 flatcars and 55 passenger cars in its own shops, steel for these being prospective tonnage for mills in the Chicago district. Distribution of steel for 5550 freight cars for the Southern railway is being delayed until the interstate commerce commission approves financing. Not much advantage is expected to be taken of the government loaning project as railroads find their financial condition does not warrant further obligations.

Various changes in production rates, led by a 5-point rise at Pittsburgh, practically balanced last week and held the national rate at 30 per cent. In some centers the present level is the lowest in several weeks and schedules for this week are for lower rates at several points. Pittsburgh rose 5 points to 30 per cent and Cincinnati, with its staggered schedule, advanced 20 points to 45 per cent. There was no change at Wheeling 38, Eastern Pennsylvania 27, Cleveland 23, New England 30, St. Louis 33.3, and Detroit 18. Chicago lost 2.5 points to 29 per cent, Youngstown fell off 1 point to 26 per cent, Buffalo 2.5 points to 25.5 and Birmingham, Ala., 3 points to 63 per cent.

Automobile production tapered further last week to 46,810, or 605 less than the week before. General Motors assembled 18,550 units, compared with 20,200 in the preceding week. Chrysler's output was 8550, against 9850; Ford's was 14,885, compared with 12,385; independents produced 4825, against 4980 the previous week.

Although steelmaking scrap has been considered practically at a bottom a further decline in its composite price was registered last week, following a drop of 50 cents at Pittsburgh and 25 cents at Chicago. Domestic and export demand are practically absent and occasional distress tonnages are appearing. The composite price on steelmaking grades lost 22 cents, dropping to $11.37, which is $2.38 below the first week in January. The iron and steel composite declined 2 cents, to $38.50, from scrap weakness. The finished steel composite is unchanged at $61.70.

An indication of shortened demand for steel and iron in Great Britain is shown in the sharp drop in imports in April, 61,469 tons, from 276,785 tons in March. Measures of the Steel Federation to aid domestic producers by discouraging buying abroad was a factor. Lighter demand and increasing stocks also tended to limit imports. Exports in April were close to the March total.

COMPOSITE MARKET AVERAGES

	May 21	May 14	May 7	One Month Ago April, 1938	Three Months Ago Feb., 1938	One Year Ago May, 1937	Five Years Ago May, 1933
Iron and Steel	$38.50	$38.52	$38.52	$38.61	$38.90	$40.06	$28.33
Finished Steel	61.70	61.70	61.70	61.70	61.70	61.70	45.10
Steelworks Scrap..	11.37	11.59	11.59	12.30	13.54	18.49	9.23

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, not strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 21, 1938	April 1938	Feb. 1938	May 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.45c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.77	2.765	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.25
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.25
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.15
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.80
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.50
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.90
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Tin plate, per base box, Pitts.	$5.35	5.35	5.35	5.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$37.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	37.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	37.00
Wire rods, No. 5 to 5/32-inch, Pitts.	47.00	47.00	47.00	47.00

Pig Iron

	May 21, 1938	April 1938	Feb. 1938	May 1937
Bessemer, del. Pittsburgh	$25.34	$25.30	$25.26	$25.26
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern del. East. Pa.	25.34	25.34	25.34	25.26
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	25.21
No. 2 fdry., Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.69
No. 2X eastern, del. Philadelphia	26.215	26.215	26.215	26.135
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	30.34	30.34	30.24	30.04
Gray forge, del. Pittsburgh	24.17	24.17	24.17	24.17
Ferromanganese, del. Pittsburgh	107.77	107.77	107.49	107.29

Scrap

Heavy melting steel, Pittsburgh	$11.25	$12.70	$14.15	$19.55
Heavy melt. steel, No. 2, E. Pa.	10.25	11.55	13.25	16.85
Heavy melting steel, Chicago	11.00	11.45	12.15	17.55
Rails for rolling, Chicago	14.75	15.25	15.25	21.45
Railroad steel specialties, Chicago	13.75	13.75	14.85	21.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.25	$4.85
Connellsville, foundry, ovens	5.25	5.25	5.25	5.30
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

In effect to June 30; new base and extras also apply; see page 75.

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.76c
Philadelphia, del.	2.72c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars, dock,	2.95c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.51c
Philadelphia, del.	3.47c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars, dock,	3.80c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.12c
New York, delivered	4.16c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars, dock,	4.40c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.20c
Philadelphia, del.	3.32c
New York, del.	3.36c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars, dock,	3.60c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.65c
Philadelphia, del.	3.77c
New York, del.	3.81c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pittsburgh	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.55c
Philadelphia, del.	2.44½c
Boston, delivered	2.68c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
St. Louis, delivered	2.54c
Pacific basing points, f.o.b. cars, dock,	2.80c
Do. floor plates	4.05c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.52c
Boston, delivered	2.66c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo, delivered	2.37½c
Gulf Ports	2.66c
Birmingham	2.40c
St. Louis, del.	2.54c
Pacific coast basing pts., f.o.b. cars dock,	2.80c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Philadelphia, del.	2.77c
Boston, delivered	2.89c
New York, del.	2.81c
Pacific coast basing pts., f.o.b. cars, dock,	3.00c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo, delivered	2.37½c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.67c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.77c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.70c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c
Pacific basing pts. f.o.b. cars, dock	3.05c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in. Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.60c
Philadelphia, del.	2.72c
New York, del.	2.76c
Cooperage hoop, Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Car axles forged, Pitts., Chgo., B'ham.	3.35c
Tie plates, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to $\frac{7}{8}$-inch	60-10 off
Do., $\frac{7}{8}$ to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	70-5 off

Square Head Set Screws

Upset, 1-in., smaller	80-5 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
$\frac{7}{16}$-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50
11 and 12	59½	49

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch lap weld	59½
12-inch, lap weld	58½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2" OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.89	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.80-58.80
6 to 24-in., Chicago	54.80-55.80
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

Rerolling Quality
4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.83
Duluth	39.00

Forging Quality Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleveland, No. 5 to $\frac{9}{32}$-inch incl.	47.00
Do., over $\frac{9}{32}$ to $\frac{41}{64}$-in. incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.5c
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.65

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16 25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	6.75c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	25.87	.....	.....	.....
Boston from Everett, Mass.	26.25	26.75	25.75	27.25
Boston from Buffalo	26.25	26.75	25.75	27.25
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.78	.....
Cincinnati from Birmingham	24.06	.....	23.06	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.69
Newark, N. J., from Birmingham	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$43.00
Do. domestic	40.00
Do. f.o.b. Chewellah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewellah, Wash., net ton, bulk	22.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., del. Pittsburgh 107.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman., 2½ carbon 106.50
2% carbon 111.50 1%, 121.50
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.70-1.75

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrotitanium, c. l., prod. plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do, less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, f.o.b. Niagara Falls, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.80
Do, smaller lots 3.00-3.10

Vanadium Pentoxide, contract, lb. contained 1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, f.o.b. Niagara Falls, ton $74.00
Do, spot 79.00
Less-ton lots, lb. 4.25c

Manganese Briquets, contract carloads, f.o.b. Niagara Falls, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Struc-tural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.26	4.46	5.46	4.11	4.10	5.76	4.21	4.96	5.00
New York (Metropolitan)	4.16	4.36	4.36	4.02	3.99	5.62	4.11	4.50	4.75
Philadelphia	4.03	4.13	4.63	3.92	3.92	5.25	4.03	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.20	4.40	4.65	4.10	4.10	5.70	4.15	4.75	5.40
Buffalo	3.90	4.25	4.25	3.95	3.80	5.55	4.00	4.83	5.38
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.19	4.19	3.89	3.89	5.49	3.94	4.69	5.34
Detroit	3.94	4.19	4.19	3.98	3.98	5.58	3.94	4.69	5.43
Cincinnati	4.08	4.28	4.28	3.98	3.98	5.58	4.03	4.78	5.43
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.00
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.12	4.37	4.37	4.02	4.02	5.62	4.12	4.87	5.52
Kansas City	4.40	4.65	4.65	4.30	4.30	5.90	4.10	4.85	5.50
Memphis	4.35	4.55	4.55	4.25	4.25	5.91	4.30	5.05	5.70
Chattanooga	4.25	4.45	4.45	4.15	4.15	5.98	4.20	4.10	4.70
Tulsa, Okla.	4.89	5.14	5.14	4.79	4.79	6.39	4.89	5.64	6.29
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	6.03	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.86	4.71	4.56	8.00	6.55	6.30	8.40	9.02	7.57
New York	3.91	4.61	4.36	7.84	6.39	6.14	9.54	9.04	7.59
Philadelphia	3.91	4.56	4.28	7.81	6.36	6.11	9.01	....	....
Baltimore	....	4.55	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.82	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.80	4.30	4.09	7.92	6.47	6.22	7.74	8.90	7.45
Cincinnati	....	4.53	4.10	7.94	6.49	6.24	9.34	8.95	7.50
Chicago	3.91	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.83	4.25	7.95	6.50	9.03	9.63	9.23	7.78
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	4.01	4.57	4.32	7.97	6.52	6.27	8.37	8.97	7.52
Kansas City	4.46	4.85	....	....	....	....	....	....	....
Memphis	....	4.86	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.34	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, May 19

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$27.34 5 10 0	$16.00	2 0 0
Basic bessemer	....	17.89	2 4 6
Hematite, Phos. .03-.05	32.31 6 10 0*	.....	.....
Billets	$39.14 7 17 6	$43.22	5 7 6
Wire rods, No. 5 gage	56.04 11 5 6	41.01	5 2 6
Standard rails	$50.32 10 2 6	$46.23	5 15 0
Merchant bars	2.44c 11 0 0	1.90c	5 5 0
Structural shapes	2.36c 10 12 6	1.77c	4 17 6
Plates, †¾ in. or 5 mm.	2.57c 11 11 3	2.23c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.11c 14 0 0	2.82c	7 15 0°
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.45c	9 10 0
Bands and strips	2.94c 13 5 0	1.99c	5 10 0
Plain wire, base	4.33c 19 10 0	2.23c to 2.64c	6 2 6 to 7 5 0
Galvanized wire, base	5.17c 23 5 0	2.85c to 2.95c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.54c to 2.72c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$5.04 1 0 3	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.09 5 9 0(a)	$15.78	563.50	$18.20	540	$25.33 63
Basic bess. pig iron	24.85 5 0 0(a)	.....	....	.....	...	27.94 (b) 69.50
Furnace coke	8.08 1 12 6	5.74	205	7.25	215	7.64 19
Billets	39.14 7 17 6	23.52	840	28.98	860	38.79 96.50
Standard rails	2.25c 10 2 6	1.50c	1,150	2.06c	1,375	2.38c 132
Merchant bars	2.71c 12 4 0††	1.40c	1,080	1.65c	1,100	1.98c 110
Structural shapes	2.45c 11 0 6††	1.37c	1,055	1.65c	1,100	1.93c 107
Plates, ††¾-in. or 5 mm.	2.60c 11 14 3††	1.76c	1,350	2.06c	1,375	2.29c 127
Sheets, black	3.50c 15 15 0§	2.03c	1,565‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.11c 18 10 0	2.93c	2,250	4.43c	2,950	6.66c 370
Plain wire	4.33c 19 10 0	2.16c	1,660	2.48c	1,650	3.11c 173
Bands and strips	2.87c 12 19 0††	1.57c	1,210	1.95c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 64.3 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1.	10.00
Bos. dock No. 1 exp.	10.00-10.50
N. Eng. del. No. 1..	11.50
Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.75-11.25
Chicago, auto, no alloy	9.00- 9.50
Chicago, No. 2 auto	8.50- 9.00
Cincinnati	8.00- 8.50
Cleveland, No. 1...	10.50-11.00
Cleveland, No. 2...	9.50-10.00
Detroit, No. 1	6.50- 7.00
Eastern Pa., No. 1..	12.00-12.50
Eastern Pa., No. 2..	10.00-10.50
Federal, Ill.	9.50-10.00
Granite City, R. R..	9.75-10.00
Granite City, No. 2.	9.25- 9.75
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.50-11.00
New York, No. 1....	†9.50
N. Y. dock No. 1 exp.	9.50
Pitts., No. 1 (R. R.)	12.75-13.25
Pitts., No. 1 (dlr.) ..	11.00-11.50
Pittsburgh, No. 2 ..	10.00-10.50
St. Louis, R. R. ...	10.25-10.75
St. Louis, No. 2 ...	9.25- 9.75
San Francisco, No. 1	12.00
Seattle, No. 1.....	10.00-12.00
Toronto, dlrs. No. 1	9.00
Valleys, No. 1	11.00-11.50

COMPRESSED SHEETS

Buffalo	8.50- 9.00
Chicago, factory ...	10.00-10.50
Chicago, dealer ...	9.50-10.00
Cleveland	10.00-10.50
Detroit	7.50- 8.00
E. Pa., new mat.....	12.00-12.50
E. Pa., old mat.	8.00- 8.50
Los Angeles	12.50-13.00
Pittsburgh	11.00-11.50
St. Louis	6.00- 6.50
Valleys	10.50-11.00

BUNDLED SHEETS

Buffalo, new	8.50- 9.00
Buffalo, old	7.50- 8.00
Cincinnati, del.	7.50- 8.00
Cleveland	7.50- 8.00
Los Angeles	11.00-11.50
Pittsburgh	10.00-10.50
St. Louis	5.25- 5.75
Toronto, dealers ...	6.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	3.50- 4.00
Detroit	4.75- 5.25
†Los Angeles	3.75- 4.00
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	15.50-16.00
Chicago (3 ft.)	13.50-14.00
Chicago (2 ft.)	14.00-14.50
Cincinnati, del.	15.25-15.75
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	16.00-16.50
St. Louis, 2 ft. & less	13.00-13.50

STEEL RAILS, SCRAP

Boston district	†9.00
Buffalo	12.50-13.00
Chicago	10.75-11.25
Cleveland	14.00-14.50
Pittsburgh	15.00-15.50
St. Louis	11.25-11.75
Seattle	16.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston district	†7.00
Buffalo	10.50-11.00
Chicago, net	7.50- 8.00
Cincinnati, dealers..	5.00- 5.50
Detroit, net	7.50- 8.00
Eastern Pa.	10.50-11.00
New York, fdry....	†6.50- 7.00
St. Louis	6.75- 7.25
Toronto, dealers, net	8.00

SPRINGS

Buffalo	14.00-14.50
Chicago, coil	14.50-15.00
Chicago, leaf	14.00-14.50
Eastern Pa.	15.50-16.00
Pittsburgh	15.00-15.50
St. Louis	12.75-13.25

ANGLE BARS—STEEL

Chicago	12.25-12.75
St. Louis	11.00-11.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, crops	14.50-15.00
Cleveland, crops ...	17.50-18.50
Eastern Pa., crops..	16.00-16.50
Pittsburgh, crops...	16.50-17.00

FROGS, SWITCHES

Chicago	11.00-11.50
St. Louis, cut	11.25-11.75

SHOVELING STEEL

Federal, Ill.	9.75-10.00
Granite City, Ill. ...	9.25- 9.75
Los Angeles	15.00-16.50
Toronto, dealers....	7.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net..	8.50- 9.00
Cincinnati, No. 2...	8.00- 8.50
Eastern Pa., No. 1	13.50-14.00
St. Louis, No. 1	8.00- 8.50
St. Louis, No. 2	9.75-10.25
Toronto, No. 1 dlr...	15.00

SPECIFICATION PIPE

Eastern Pa.	12.00-12.50
New York	†7.50- 8.00

BUSHELING

Buffalo, No. 1	8.50- 9.00
Chicago, No. 1	9.25- 9.75
Cincin., No. 1, deal..	6.25- 6.75
Cincinnati, No. 2...	2.00- 2.50
Cleveland, No. 2 ...	5.50- 6.00
Detroit, No. 1, new	6.25- 6.75
Valleys, new, No. 1.	10.00-10.50
Toronto, dealers....	6.00

MACHINE TURNINGS (Long)

Birmingham	6.00- 7.00
Buffalo	4.50- 5.00
Chicago	4.50- 5.00
Cincinnati, dealers..	2.50- 3.00
Cleveland	5.50- 6.00
Detroit	3.25- 3.75
Eastern Pa.	6.50
Los Angeles	4.00- 4.25
New York	†2.50- 3.00
Pittsburgh	6.50- 7.00
St. Louis	2.50- 3.00
Toronto, dealers....	6.00
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	1.25
Buffalo	4.50- 5.00
Cincinnati, dealers..	2.00- 2.50
Cleveland	5.50- 6.00
Eastern Pa.	6.00- 6.50
Detroit	3.75- 4.25
New York	†2.50- 3.00
Pittsburgh	6.00- 6.50
Toronto, dealers....	6.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem...	†5.00
Bos. dist. for mills.	†6.00
Buffalo	4.00- 4.50
Chicago	4.75- 5.25
Cincinnati, dealers..	2.00- 2.50
Cleveland	5.50- 6.00
Detroit	3.75- 4.25
E. Pa., chemical....	10.00-11.00
New York	†3.00- 3.50
St. Louis	2.00- 2.50
Toronto, dealers....	6.50

PIPE AND FLUES

Cincinnati, dealers..	5.00- 5.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	8.00- 8.50
Chicago, net	7.50- 8.00
Cincinnati	5.50- 6.00
Eastern Pa.	10.00-10.50
New York	†7.50
St. Louis	7.00- 7.50

FORGE FLASHINGS

Boston district	†4.50
Buffalo	8.50- 9.00
Cleveland	10.00-10.50
Detroit	5.75- 6.25
Los Angeles	9.00
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston district	†4.50
Chicago, heavy	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	12.00-12.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.00- 9.50
Chicago, elec. fur...	10.00-10.50
Eastern Pa.	9.50 10.00
St. Louis	8.00- 8.50
Toronto	7.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	15.50-16.00
Boston district	†14.00
Chicago, net	15.50-16.00
Eastern Pa.	21.50-22.50
St. Louis	17.00-17.50

SHAFTING

Boston district ....†13.00-13.25	
New York .....†14.00-14.50	
Eastern Pa.	18.00-18.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham ...	14.00-15.00
Boston dist., iron...	†8.25
Buffalo, steel	14.00-14.50
Chicago, iron	12.00-12.50
Chicago, rolled steel	13.50-14.00
Cincinnati, iron.....	12.00-12.50
Eastern Pa., iron...	14.50-15.00
Eastern Pa., steel..	15.50-16.00
Pittsburgh, iron ..	13.00-13.50
Pittsburgh, steel ..	15.00-15.50
St. Louis, iron	11.25-11.75
St. Louis, steel	12.75-13.25

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†10.00
N. Eng. del. No. 2..	11.50
N. Eng. del. textile	14.00-14.50
Buffalo, cupola	12.50-13.00
Buffalo, mach.	13.00-13.50
Chicago, agri. net..	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, railr'd net	10.00-10.50
Chicago, mach. net.	10.50-11.00
Cincin., mach. cup...	10.00-10.50
Cleveland, mach....	14.50-15.00
Eastern Pa., cupola.	14.50-15.00
E. Pa., mixed yard.	11.50-12.00
Los Angeles, net....	13.50-14.00
Pittsburgh, cupola..	13.50-14.00
San Francisco, del..	13.50-14.00
Seattle	10.00-12.00
St. Louis, No. 1.....	10.50-11.00
St. L., No. 1, mach.	12.25-12.75
Toronto, No. 1, mach., net	11.50

HEAVY CAST

Boston dist. break..	†7.00- 7.25
New England, del...	10.50-11.00
Buffalo, break.	10.00-10.50
Cleveland, break. ..	13.00-14.00
Detroit, break.	10.00-10.50
Detroit, auto net...	11.00-11.50
Eastern Pa.	12.50-13.00
Los Ang., auto, net.	13.00-13.50
New York, break...	†8.00- 8.50
Pittsburgh, break...	11.00-11.50

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del...	16.00
Buffalo	12.00-12.50
Chicago, R. R.	11.50-12.00
Cincin., agri. del...	9.25- 9.75
Cleveland, rail	14.50-15.00
Detroit, auto	10.00-10.50
Eastern Pa., R. R...	14.00-14.50
Los Angeles	17.50-18.00
Pittsburgh, rail.....	14.00-14.50
St. Louis, R. R.	10.00-10.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†9.50
Chicago	14.50-15.00
Eastern Pa.	16.00-16.50
New York .....†14.00-14.50	
St. Louis	13.25-13.75

LOCOMOTIVE TIRES

Chicago (cut)	14.00-14.50
St. Louis, No. 1	12.00-12.50

LOW PHOS. PUNCHINGS

Buffalo	14.50-15.00
Chicago	13.50-14.00
Eastern Pa.	16.00-16.50
Pitts. (light & hvy.)	15.00-15.50
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos...	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom..	12.00
Tungsten, sh. ton. unit, duty pd. nom.	$15.75
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f..	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% ..... nom.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

Base Prices Are Reaffirmed; Extras On Flat Rolled Products Revised

■ ANNOUNCEMENT was made May 18 by Carnegie-Illinois Steel Corp., Pittsburgh, that prices for third quarter were reaffirmed at second quarter level, except on certain flat-rolled products. The statement follows:

Carnegie-Illinois Steel Corp. reaffirmed its present quarterly prices today (May 18) on its products for delivery and consumption in the United States during the third calendar quarter of 1938 with the exception of the prices for certain flat-rolled products.

The advisability of effecting certain adjustments in the relationship between hot-rolled strip, hot-rolled sheets, cold-rolled sheets and tin mill black plate was indicated by this company's production experience during 1937, which was the first good year since the installation of the new wide continuous mills.

Therefore, new lists of extras and deductions have been developed. Inequalities created by the new methods of production have been corrected. In addition, in the interest of simplification, a few product names have been eliminated, gage and width extras combined, and a realignment of the sizes covered by each specific product has been effected.

New Bases Are Announced

The application of the new lists of extras and deductions to second quarter base delivered prices would reflect an increase; therefore, in order to provide an equitable adjustment in the average selling price, the following carload base prices are announced, effective from date to Sept. 30, 1938, inclusive, for delivery and consumption in the United States:

Hot-rolled strip, 2.325c, Pittsburgh; 2.43c, Gary. Hot-rolled sheets, 2.325c, Pittsburgh; 2.43c, Gary. Cold-rolled sheets, with primes and seconds arising, 3.375c, Pittsburgh; 3.48c, Gary. Tin mill black plate, 3.325c, Pittsburgh; 3.43c, Gary.

Explanation of the application of the new bases and extras and deduction is as follows:

The application of the new lists of extras and deductions to the second quarter base prices of these four products would result in an increase in the average net price of slightly more than $1 per ton; therefore, in order to effect an equitable adjustment between second and third quarter average prices the base price of these products is reduced $2 per ton.

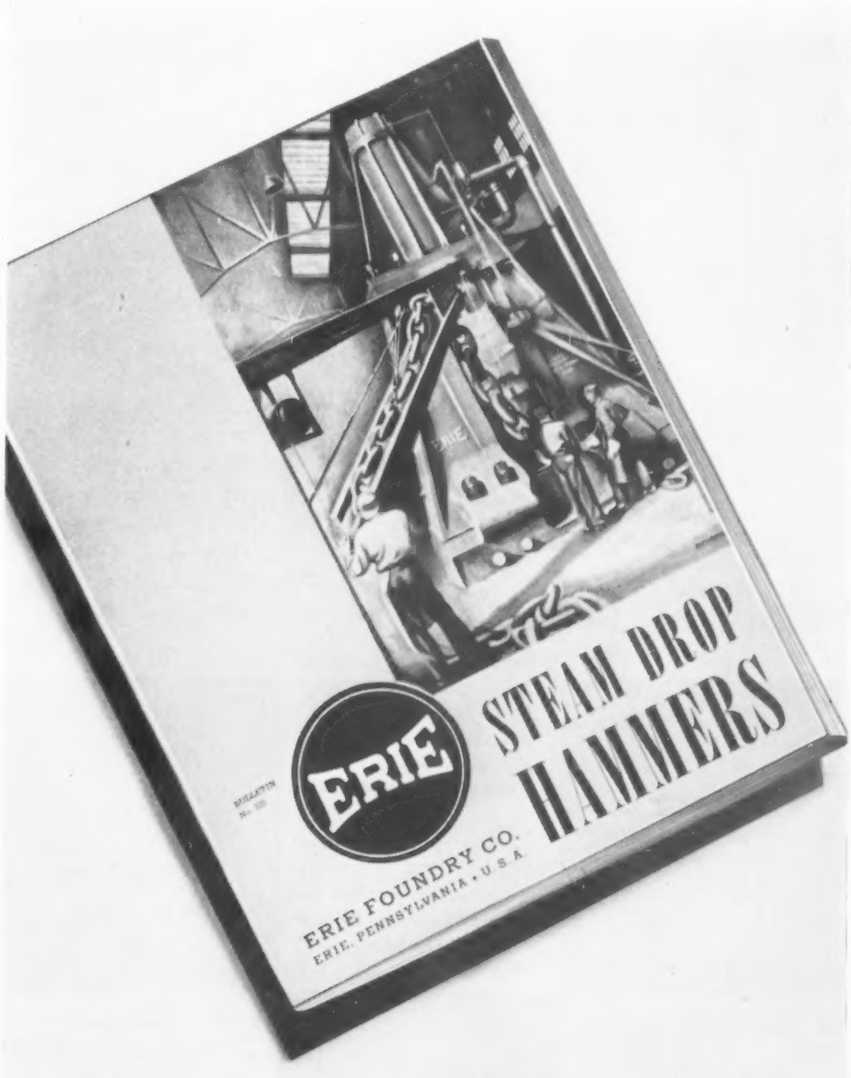
Although the average prices are not materially changed, there are, nevertheless, many important adjustments in the net prices of individual items, which changes have been effected by substantial increases and deductions in the extras.

Particular attention is directed to the sizes from 24 to 48 inches wide which were formerly base sizes on the sheet lists and which now carry extras of $3 per ton. The base price is being reduced $2 per ton, therefore the net result is an increase of $1 per ton for these sizes.

The effective date in the announcement is May 18, 1938, and these prices will apply to sales for shipment up to and including Sept. 30, 1938. This means that two sets of base prices and two sets of extra lists will apply on each one of these four products from this date up to and including June 30, 1938; in other words, the buyer will be offered that base price and that list of extras and deductions which reflect the lowest net price for him. However, the new lists of extras and deductions will not apply to the present second quarter base prices, or vice versa.

Changes in net prices of these products will apply to unshipped tonnage as of May 18, 1938.

Gage and width extras are being combined and substantial reductions have been made on some of the wider widths. In the interest of



500 Forge Shop Men will want this New Erie Catalog!

simplification the base prices for hot rolled annealed sheets and for heavy cold rolled sheets have been eliminated.

The new tin mill black plate base price, delivered Pittsburgh, is $3.325, and to this should be added the new extras, the net price being the same as heretofore with the exception that the size from 12 to 15 inches is increased $2 per ton.

In the new hot rolled strip list quantity extras and deductions will be determined by gage or thickness and width only, whereas the old list for this product included length as a determining factor in arriving at the quantity extra or deduction.

These four products have been reclassified as to the specific sizes they cover, thereby eliminating the confusion which previously existed and which was brought about by the fact that a buyer could purchase several different flat-rolled products which were identical as to physical characteristics at different prices.

In general the new hot rolled strip list covers the same sizes as in the past with the exception of sizes wider than 12 inches, 16 gage and heavier. The new tin mill black plate list covers only those sizes in width from 12 to 32 inches in gages 29 and lighter. All other hot rolled sizes are covered by the new sheet card.

The new cold-rolled sheet list covers sizes 12 inches and wider, with the exception of those sizes just enumerated as being covered by the tin mill black plate list.

Important changes also have been made in the quantity extra and deduction list, the new card following:

QUANTITY EXTRAS AND DEDUCTIONS

Quantity Deductions apply on items of 25 net tons or more of one size (one gage or thickness and one width) and are determined by the total weight of one grade, one analysis, and one finish, released at one time for shipment to one destination within a period not exceeding 15 days. This total weight of one grade, one analysis, and one finish may be released either in one size or in a combination of sizes, but if a combination of sizes is released, the weight of each size must be at least 25 net tons.

Quantity Extras are determined by the total weight of a size (one gage or thickness and one width) of one grade, one analysis, and one finish, released for shipment to one destination at one time.

On quantities of a size up to 10 tons, shipment of 10 per cent over or under and on quantities of a size 10 tons and over, shipment of 5 per cent over or under is permissible.

QUANTITY DEDUCTIONS

	Deduct	
150 net tons or over	0.15	(D4)*
Under 150 to 100 net tons, incl.	0.10	(D3)*
Under 100 to 50 net tons, incl.	0.075	(D2)*
Under 50 to 25 net tons, incl.	0.05	(D1)*

QUANTITY EXTRAS

Under 25 net tons to 1 net ton, incl.	BASE
Under 2000 lbs. to 1000 lbs. incl.	Add 0.50 (E1)*
Under 1000 lbs.	Add 1.00 (E2)*

*Differential symbols for invoicing.

American Steel & Wire Co. reaffirms current base prices on rods, wire and wire products for third quarter. Base price, however, on cold-rolled strip is changed to $3.10 per 100 lbs., Pittsburgh or Cleveland and $3.30 per 100 lbs., Worcester, Mass., to compensate for the change in sheet base.

Tin Plate

Tin Plate Prices, Page 70

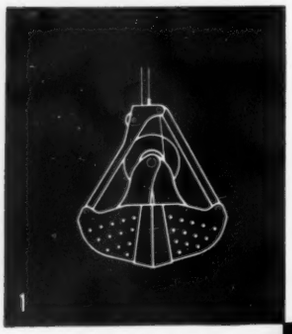
Pittsburgh—Tin plate production is unchanged with the demand picture the same as reported for some time. The production rate is approximately 55 per cent of capacity and is not expected to vary much from that figure. It is thought a few releases which had been held up will now be made following action on third-quarter prices.

New York—Some of the tension which recently existed in the tin plate market with respect to prices has eased, now that leading sellers are reaffirming prices generally for third quarter.

It was thought in many quarters that if a change in price on tin plate were to be made soon it would come when sellers were opening books for third quarter on other products. Over recent weeks there has been some hesitancy among spot buyers of tin plate in particular because of reports of shading, even though unconfirmed.

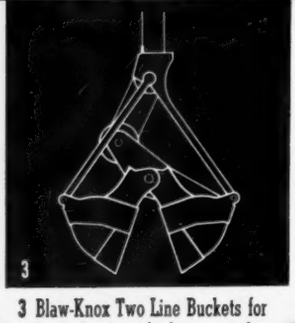
Contract customers are specifying

THERE'S A
BLAW-KNOX
BUCKET
FOR EVERY STEEL
PLANT SERVICE



1 Granulated B. F. Slag, comparatively easy digging, permitting use of Blaw-Knox POWER WHEEL BUCKETS with large, hardened, slow-moving bearings—principally a maintenance problem.

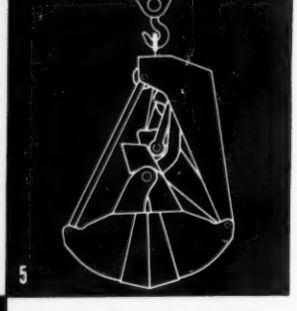
2 Blaw-Knox ORE BUCKETS four-rope type, low height for high storage, anti-friction sheave bearings—exceptional digging qualities developing 1 to 1 ratio or better.



3 Blaw-Knox Two Line Buckets for hard digging; built at weights suitable for handling O. H. slag, limestone, Spiegel, Ferro Mang., pig iron. Adaptable to overhead cranes and locomotive cranes.

6 Blaw-Knox Two Line Buckets for locomotive cranes built at various weights to suit operating requirements including medium weight types adaptable to broad range of service.

4 When "hook-on" operation is necessary, much is gained by using Blaw-Knox 2 line type hook-on buckets. Especially suited to O. H. cinder yard service where 2 hooks are usually available.



5 Blaw-Knox Single Line "Hook-On" Buckets. Heavily built for O. H. service and medium weight types for handling roll scale, also for handling clay and other materials in O. H. Ladle House.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2002 FARMERS BANK BUILDING • PITTSBURGH, PA.

more freely as the food packing season approaches; spot buyers, particularly engaged in producing general line containers, are also showing more interest as a result of this easing tension over prices. Export demand continues to shrink, due not only to the fact that foreign buyers carried over a substantial tonnage into this year, but are now able to obtain better deliveries from foreign producers.

Sheets

Sheet Prices, Page 70

Pittsburgh—The net result of revisions in sheet prices for third quarter by the major producer is not yet clearly understood. However, the classifications of hot-rolled annealed and heavy cold-rolled sheets have been eliminated, and the cold-rolled and hot-rolled sheet lists just issued cover sizes 12 inches and wider, with the exception that tin mill black plate covers those sizes from 12 to 32 inches in gages 29 and lighter. These changes have eliminated considerable overlapping and duplication of prices in the various lists previously issued. Sheet production for the country is estimated at approximately 34 per cent, with galvanized sheet production at 39 per cent. No announcement has as yet been made on galvanized sheet prices but is expected soon.

Cleveland—Requirements for hot and cold-rolled sheets have not shown any material change although some tonnage was held up prior to third quarter price announcements. Current buying is limited to fill-in purposes only.

Chicago—Sheet demand is fairly steady, business so far this month making a favorable comparison with April tonnage despite continued quiet in automotive needs. Consumption in the farm equipment industry is declining but operations of miscellaneous sheet users show little change. Revisions recently announced in extras and a reduction of $2 a ton in the base price will result in little change in net quotations. Quotations on galvanized roofing material lately have been weak though prices of flat galvanized sheets have been relatively steady.

Boston—Sheet buying has declined. Jobbers are placing small fill-in lots and larger consumers buying direct from mills as a rule are not in need of stock due to low consumption. The latter are doing some small spotty purchasing.

New York—At least a temporary increase in buying of sheets is expected as soon as the new bases and extras are fully understood, as some consumers have held back buying until prices were settled. Representatives of independent mills have not received the list of extras and deductions although producers indicate intention of following the leading interest.

Philadelphia—The new list of deductions and extras is expected to bring out little business as principal consumers assert they will continue to buy only as needed. Some coverage doubtless will be made on items affected by the new schedules, such as widths from 24 to 48 inches which take an increase of $1 per ton and tin mill black, 12 to 15 inches, on which the net increase is $2 per ton. Demand is slow and little activity is expected before mid-August. E. G. Budd Mfg. Co. is expected to place stainless sheets soon for 40 light weight truck trailers. This interest is also understood to have considerable railroad work for which releases are awaited.

Cincinnati — Sheet mills are operating at 30 to 35 per cent on a steady flow of orders to meet urgent

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consumer needs. Warehouse requirements and galvanized give the nearest approach to normal demand. Consumers are not anticipating future requirements, this policy not likely to be altered with announcement of third quarter prices until other conditions change.

St. Louis—Sheet demand is reported extremely quiet, both in new commitments and specifications on material previously ordered. Opening of books for third quarter has failed to cause a ripple of interest. It is expected that consumers through the remainder of this year will order only for actual needs and only far enough in advance to secure delivery of various grades when needed for consumption. Meanwhile, no sign is apparent that would indicate the building trade will take delivery on any large tonnage of sheets.

Birmingham, Ala. — Sheets have shown a variable tendency over the past few days. Business in roofing is particularly scarce as is the case with drum stock sheets. Manufacturers' sheets, on the other hand, are up somewhat in demand.

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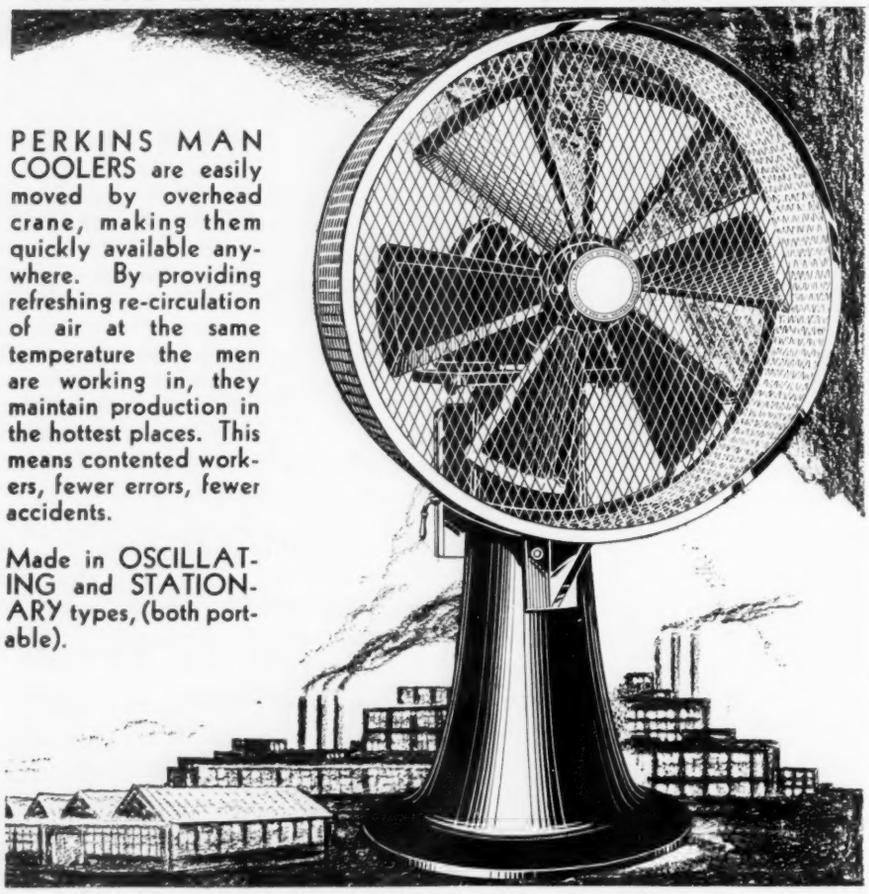

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Strip

Strip Prices, Page 71

Pittsburgh — Strip production for the country is estimated at around 20 per cent for hot-rolled and about 25 per cent for cold-rolled. Important changes in the classifications have been made by a leading producer in announcing third-quarter prices. The new hot-rolled strip list covers sizes only up to 12 inches in width, instead of up to 24 inches as previously, and only 16 gage and heavier.

Cleveland — Sellers report only slight changes in current specifications for hot and cold-rolled strip. Demand from stove, radio and household equipment manufacturers continues limited to actual needs, although inventories have generally reached unusually low levels. American Steel & Wire Co. has announced prices on cold-rolled strip will be reduced $2 a ton to compensate for the change of $2 in the base prices for cold-rolled sheets. New price f.o.b. Cleveland is 3.10c per pound.

Chicago — Strip buying is holding well, business showing a slight gain over April. The market has been affected little by uncertainty over third quarter prices and this factor now is eliminated with the reduction of $2 a ton accompanied by new extras and differentials. Buying is fairly well diversified but is confined to small lots.

Boston—With the larger consuming industries not buying, cold strip volume is confined mostly to miscellaneous requirements, which are light. Tonnage reaching mills thus far this month is barely equal to the April rate and operations are several points lower at some mills. Current orders are small and for quick delivery. Stanley Works, American Tube & Stamping Co., Bridgeport, has been awarded a contract for strip, navy department, delivery Baldwin, included in the opening of March 22.

New York — Narrow cold strip volume is held to small fill-in orders for prompt delivery. A combination of low operations and substantial banks of finished fabricated products results in curtailed consumption and light buying. The larger industries are not placing much volume. Some scattered buying of hot strip is expected shortly.

Philadelphia — Narrow strip continues quiet. Some stampers are figuring on more work but releases are slow in coming out. Prices are firm.

Birmingham, Ala.—The off season in strip continues. Mills will begin

to get some strip business in July with improvement expected from then through the cotton tie season.

Plates

Plate Prices, Page 70

Cleveland—Demand for standard steel plates has not registered any gains this month, and in a few instances a slight easing is noted. Pittsburgh - Des Moines Steel Co., Pittsburgh, has the general contract for a standpipe for Akron, O., involving 300 tons. The four storage tanks for the Shell Petroleum Corp. at Toledo, O., involving approximately 1000 tons, are still pending.

Chicago—Plate buying is in small lots, orders from structural fabricators including few large projects, while requirements of railroads and car builders are light. Some freight car inquiries are appearing but these are not active and there is no assurance of early revival in equipment building. Dam building in Oklahoma and Washington involves more than 3000 tons of fabricated plates.

New York — Plate sellers anticipate some increase this week as a result of reaffirmation of prices for third quarter. Recently there has been a decided lull and there is little doubt, according to some trade leaders, that this has been due in part to hesitancy pending the opening of books for next period. A feature is pending shipwork, notably the four cargo vessels for the American Export Line Inc., this city, involving approximately 16,000 tons, and on which bids were opened last week, and the 30 arc-welded scows for this city. On the four cargo boats Bethlehem Shipbuilding Co. Ltd. was low on a fixed bid and the Sun Shipbuilding & Dry Dock Co., Chester, Pa., low on an adjusted price basis. On the scows no decision has been made as to which yard will obtain the business.

Pending approval by the interstate commerce commission of construction awards, carbuilders continue to hold up steel specifications for the Southern Railway freight cars.

Philadelphia — There have been no new ship plate releases although some mills are more active on releases issued two week ago. One mill recently active on navy work has taken off one furnace. Most new business is from miscellaneous sources.

Boston—In case the contract goes to Bethlehem Steel Co., low on a fixed price basis, four cargo liners for American Export Lines Inc., taking 14,000 tons of hull plates, will be built at the Quincy, Mass., yards. Bids on the ships closed May 17 with the maritime commission. With other ship-building contracts pending, the outlook for plates for boat building is bright, but other consuming outlets offer little tonnage.

San Francisco—The only award of size went to unnamed interests and called for 200 tons of plates and shapes for two coast guard cutters. Steel Tank & Pipe Co., Berkeley, Calif., submitted the low bid on 877 tons for a 25 and 36-inch welded steel pipe line for the east bay municipal utility district, Oakland, Calif. Other pending business is confined to lots of less than 100 tons.

Birmingham, Ala.—Plate business is light. With start of production, however, on the Southern railway order for 2000 freight cars, a substantial plate tonnage is in prospect for the district.

Plate Contracts Placed

1125 tons, three 93,000-barrel tanks,

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The Classics

■ In the May issue of "The Contactor", Clark Controller house organ, the dance-loving editor complains about trying to rest his weary bones on a chair with brinell hardness of 745, after being outsmarted by th' madam into going to "A Dans Revue Devoted to Terpsichorean Interpretation". Nothing to worry about, my good man, nothing at all. Just wait until you have sat through "Recitations on the Underlying Social Aspects of Beethoven's Use of the E Flat" and you'll think that chair of yours is nitrided Nitralloy.

Tell's Tall Story

■ Tell Berna, National Machine Tool Builders' exec. sec'y., used to be quite the speedster, you know. On one occasion back in 1912, it seems he was running in Europe and was scheduled for the two-mile feature in Germany but the Deutschlanders couldn't find a two-miler in the Reich. Reich or wrong, they picked four of their crack half-milers and formed a relay team. Tell ran against these boys and won, by gad. And they call themselves the Fascist!

Soak the Rich

■ IT MAY or may not be news to you that things are moving along serenely among members in good sitting of the Ancient and Independent Order of Soakers, a nonprofit, nonpolitical, nonsectarian organization of folks who like to read in the bathtub. The AIOS, which includes such illustrious names as George Bernard Shaw, H. G. Wells and even Hank Greenberg, was born in the nimble brain of that indefatigable publicist, Josh Sarasohn, of the Briggs plumbing ware division in Detroit. Perhaps by now you have smelled the commercial tie-up, Briggs being a leading supplier of the new steel bathtubs.

Certificate of membership in the AIOS is a handsome engraved affair, proclaiming that the "member whose name appears hereon is hereby entitled to a minimum of one hour per diem in the privacy of the bathroom for the purpose of reading books, magazines, newspapers (including the Funnies) without hindrance, interference, wisecracks or other annoyance by any other members of the family."

It was just about a year ago that Josh enrolled the Shavian menace in his exalted order. At the time GBS postcarded from his retreat at 4 Whitehall Court, London, to the effect that "unfortunately, in this country a Soaker is a person who is never sober, and seldom dreams of having a bath. And I am a teetotaller!"

If you are a devotee to the forgotten art of soaking and if you feel in need of a membership in the AIOS to hang on the bathroom wall, drop a line to Josh Sarasohn at the Briggs Mfg. Co., Hamtramck Plant, Detroit, and tell him we deputized you to demand admission to the sacred Konklave. He will give out.

Vim and Vigor

■ A magazine's good health is reflected by that oft used expression "reader interest". STEEL's health is checked periodically and the latest examination shows the patient doing very nicely, thank you. Recession or no recession, STEEL's renewal pulse is steady around 80 per cent. Readership growth continues upward. Timing is excellent, and the sixth sense of what the reader wants is as acute as ever. Typical bill of health is that received from E. S. Burke, Dominion Steel & Coal Corp. "Along with these department heads, your publication is read by their respective assistants as well as many others who may be considered key men". Metabolism chart shows 5.88 readers for every copy.

—SHRDLU

Sinclair Refining Co., East Chicago, Ind., to Graver Tank & Mfg. Co. Inc., East Chicago, Ind.

335 tons, 1,500,000-gallon welded standpipe, Akron, O., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

250 tons, tanks for Colonial Beacon Oil Co., Portsmouth, N. H., to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

877 tons, 25 and 36-inch welded steel pipe, east bay municipal utility district, Oakland, Calif.; Steel Tank & Pipe Co., Berkeley, Calif., low.

420 tons, fuel oil tanks for East Boston Coal Co., Boston.

225 tons, fuel oil tanks for Charles Murray Co., Bangor, Me.

Bars

Bar Prices, Page 70

Pittsburgh—Although there may be some small release action as a result of reaffirmation of prices for third quarter, it is not expected that this will have much effect on the market. Specifications over the past week showed little change from the previous week and it is expected May tonnage of steel bars will be approximately equal to that of April.

Cleveland—Requirements for commercial and alloy steel bars have registered little change this month. Demand from auto partsmakers and railroad equipment manufacturers continue almost dormant. However, road and agricultural equipment manufacturers are fairly busy although a slight easing of demand is noted.

Chicago — Steel bar sales were lighter the past week. Part of the recent letdown is attributed by some producers to deferred buying pending announcement of third quarter prices though other mills discount this factor as a business influence. Reaffirmation of present quotations, however, is expected to provide some stabilization to demand but with consumption declining seasonally in some directions, there is no prospect of marked revival in buying soon.

Boston—Soft and cold-finished bar buying has receded with small fill-in orders accounting for most volume. Demand for forging material is more spotty, users having sufficient stock for current operations in most instances. Alloy bars and tool steel stock move in small lots. Storms Drop Forging Co., Springfield, has booked a substantial part of the steel and alloy forging contract for the Newport, R. I., torpedo station.

New York — With bar prices reaffirmed for third quarter, a slight pick-up in specifications is expected this week. While there had been a growing belief over the past

fortnight that there would be no change in prices, sellers nevertheless bought as sparingly as possible until they had definite assurance.

Philadelphia — Warehouses continue the most active outlet for merchant bars though there are a few other bright spots, such as the farm equipment trade. A district cold drawing mill is reducing inventory. Sellers are encouraged over the firm price situation, which continues in spite of the slow pace of buying.

Birmingham, Ala.—Merchant bars are particularly quiet with only spotty tonnage moving. Demand for concrete bars, most of them used in government work, is fairly satisfactory but prices generally are weak.

Pipe

Pipe Prices, Page 71

New York — Award of 750 tons of cast pipe to the Burlington, N. J., foundry by Yonkers, N. Y., is outstanding, most purchases being for fill-in miscellaneous lots. The expected inquiry due soon by New York city will be larger than first estimated. While plans are being made for the possible purchase of 11,000 tons, the next call for bids is expected to cover about 5000 tons. This pipe will be 6 to 20-inch cement-lined, yard stocks.

The price situation here on merchant pipe continues greatly disturbed by sharp concessions by resellers. While the average working margin for resellers throughout the country is said to be around 17 per cent, providing for handling costs and profits, a number of resellers here have worked their margin down to 3 and 4 per cent, which represents a distinct loss. Jobbers with stocks on consignment are unable to compete in view of the continued steadiness in the prices of mills which own the stocks.

Considerable pressure on mills by these distributors for lower prices has apparently been without success and so far as is learned no early reduction in mill discounts is indicated.

Chicago — While new federal spending program eventually is expected to stimulate cast pipe buying, some proposed work intended to be financed privately has been held up by municipalities who see prospects of receiving government funds. A number of jobs involving cast pipe are included in the list of approved PWA projects. New inquiries here are headed by 800 tons for the Chicago sanitary district.

Pittsburgh — Pipe and tubular goods market is quiet. Little tonnage has been moved and demand has not been forthcoming. Reaffirmation of prices for third quarter is not expected to change picture as this action was anticipated. Of interest here recently was an all-water shipment of tubular goods to the interior of Arkansas, the first attempted.

Cleveland — Sales and shipments of standard steel pipe out of jobbers' stocks remains substantially unchanged. However, the city of Cleveland took bids May 20 on 12,000 feet of 36-inch and 8000 feet of 30-inch steel pipe for the Brookpark road water main. This is the largest pipe line project before the trade with the exception of Standard Oil Co.'s proposed line running from Fostoria to Lima, O.

Boston — Three cast pipe contracts, involving 529 tons for delivery at Bridgewater, Mass., state farm, Brookline, Mass., and Bos-

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ton, the latter a metropolitan district commission inquiry, have been placed in addition to a considerable number of smaller tonnages. Inquiry for 2500 tons, Osterville, Mass., has been postponed and a federal loan or grant may be sought. Merchant steel pipe demand in small lots is steady with slightly more work pending taking limited wrought pipe needs.

Birmingham, Ala.—Cast pipe operations are again on a hand to mouth basis with some concern over ability to maintain even present curtailed production schedules.

San Francisco—Interest centers around outcome of bids just opened on 1874 tons of 4 to 16-inch cast iron pipe for the East bay municipal utility district, Oakland, Calif. Bids have also just been taken on 800 tons of 10-inch cast iron or steel pipe for a pipe line between Palo Alto and Moffet Field, Calif., and apparently United States Pipe & Foundry Co. is low with the general contractors on cast iron pipe. This company also booked 188 tons of 8-inch, Class 250 pipe for the treasury department, San Francisco.

Seattle—Demand for cast iron pipe is exceptionally slow and no projects of importance are announced. About 200 tons are pending in bids at Spokane, Wash., and Sweet Home, Oreg., openings on May 19 and 24 respectively. No announcement has been made regarding award of 12 to 20-inch mains for Lewistown, Mont.

Cast Pipe Placed

750 tons, various sizes, Yonkers, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.; also purchased 140 tons cement-combination pipe on alternate.

250 tons, 24-inch, Chicago, to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

219 tons, 4 to 20-inch, Brookline, Mass., to Donaldson Iron Works, Emaus, Pa.

190 tons, 6 to 12-inch, Metropolitan district commission, Boston, to Warren Pipe Co., Everett, Mass.

188 tons, 8-inch, class 250, treasury department, invitation 5328, San Francisco, to United States Pipe & Foundry Co., Burlington, N. J.

120 tons, 12-inch, Bridgewater, Mass., state farm, to Warren Pipe Co., Everett, Mass.

Unstated tonnage, 53,000 feet of 6 to 10-inch, Green Bay, Wis., to James B. Clow & Sons Co., Chicago.

Cast Pipe Pending

1874 tons, 4 to 16-inch, class 150, East bay municipal utility district, Oakland, Calif.; bids opened.

800 tons, 10-inch, cast iron or steel, pipe line between Palo Alto and Moffett Field, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low on cast iron pipe.

800 tons, various sizes, section KK, Stickney sewage disposal plant, Chicago sanitary district; bids June 9.

Steel Pipe Pending

1100 tons, 12,000 feet of 36-inch and 8000 feet of 30-inch, Brookpark road water main, Cleveland; Bethlehem Steel Co., Bethlehem, Pa., reported low.

Unstated tonnage, 350 lengths, 14-foot sections, 20-inch I. d. welded shore discharge pipe, U. S. engineer, St. Louis, bids May 26, schedule 180.

Wire

Wire Prices, Page 71

Pittsburgh — The action of producers here in reaffirming wire and wire product prices for the third quarter was generally expected and as a result will not bring in any deferred tonnages. Production for May undoubtedly will be lower than for April, although there will be little difference.

Cleveland — Producers of merchant and manufacturers' wire note little change in demand. Buying by auto partsmakers and other consumers of manufacturers' wire is only for actual needs. Demand from agricultural sources continues to recede gradually.

Chicago — Wire demand has quieted following slight gains earlier in the month. Part of recent hesitancy in demand is attributed to uncertainty over third quarter prices. This factor has been eliminated by announcement of a leading producer of unchanged quotations. May sales as a whole are expected to show little change from April but there is no expectation of any marked rise in orders soon.

Boston—Wire demand is down slightly, finishing operations at some mills being a few points lower. Buying, while light, is fairly well diversified with orders small and prompt delivery specified. Mill operations are irregular and rod mill schedules are spotty. The automobile trade is still notably slack. Buying is kept down by low consumer operations.

John A. Roebling's Sons Co., Trenton, N. J., is low on 210,000 pounds of steel welding electrodes for the Portsmouth N. H., navy yard at $13,373, bids May 17. For Boston navy yard, Reid-Avery Co., Baltimore, is low on 174,400 pounds at $14,037.60. The latter company is also low on 680,000 pounds for Brooklyn at $50,040 while McKay Co., Pittsburgh, is low on 560,000 pounds for Philadelphia. Reid-Avery is also low on 279,000 pounds for Norfolk, Va. at $21,811.90 and 101,000 pounds, Charleston at $7944.20. Electric Arc Cutting and Welding Co., Newark, N. J. is low on 220,000 pounds, Mare Island, Calif., at $18,700 while John A. Roebling's Sons Co., Trenton, with $11,936.80,

is low on 154,000 pounds for Puget Sound, Wash. In addition to the above, bids were taken on 68 tons for various deliveries.

New York — Dull demand for most wire products continues, buying of some goods receding from the recent light volume. Demand for merchant products is smaller while consumer inventories are reaching a low point in numerous instances with more gaps in stocks appearing, low operations, notably by the larger consuming industries, tend to keep purchases at a minimum. Wire rod buying is also dull with rod mill operations uneven. The clearing up of third quarter price uncertainty is not expected to lift demand materially at this time.

Rails, Cars

Track Material Prices, Page 71

While it is believed that tonnage has been closely earmarked for the construction of the 5550 freight cars for the Southern railway no formal contracts have yet been signed by the carbuilders pending approval of their own contracts by the interstate commerce commission. As the work was scheduled to get under way promptly, much disappointment is being expressed over continued delay by the commission in approving the awards. Little additional car business is pending. Edward G. Budd Mfg. Co., Philadelphia, has booked an order for 50 lightweight stainless steel motor-freight semitrailers from Horton Motor Lines Inc., increasing its fleet to 66. They operate from Charlotte, N. C., to New York, Atlanta and other eastern cities. Each is 30 feet long and 11 feet 8 inches high, with 1600 cubic feet capacity and weight of 6300 pounds. About 3000 pounds weight is saved over standard construction.

Car Orders Placed

Chicago, Milwaukee, St. Paul & Pacific, 464 flat cars and 55 passenger cars, to own shops.

Rail Orders Placed

500 tons, sitandard T rails, for the Cleveland Railway Co., Cleveland, to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

Semet Solvay Co., New York, ten 70-ton hopper cars; bids asked.

Locomotives Pending

City light department, Seattle, Wash., one 35-ton diesel locomotive; bids June 1.

Raritan arsenal, New Jersey, one 35-ton gasoline mechanical drive or diesel locomotive, bids June 7.

Buses Booked

American Car & Foundry Motors Co., New York: Twenty-six 37-passenger coaches for Santa Fe Trail Transportation Co., Wichita, Kans.; six 35-passenger coaches for Boston Elevated Railway, Boston; one 30-passenger street car type coach for Pittsburgh Motor Coach Co., Pittsburgh.

Shapes

Structural Shape Prices, Page 70

New York—Structural contracts are few and most of them small, 1560 tons for a bridge approach being the largest. Several small bridge awards include 225 tons for the West 238th street span, New York. Inquiry is light with requirements for world's fair buildings holding well.

Pittsburgh — The largest part of newly announced projects consists of dam developments financed publicly. Private construction is still lagging.

Cleveland—Structural market has failed to show substantial change with inquiries and awards generally limited. One of the few exceptions is a plant extension for the Link Belt Co., at Indianapolis, involving approximately 400 tons for which Austin Co., Cleveland has requested bids.

Chicago — Fabricators have few inquiries of more than 100 tons to figure. Smaller jobs are fairly numerous, but these are scattered over a wide area. For a state building at Denver 900 tons of shapes have been placed.

Boston — Contract for a 617-ton bridge, North Kingston, R. I. to a Milwaukee fabricator is outstanding in New England. For the Manchester, N. H., armory, 150 tons, went to the Everett, Mass., shop. More small bridges are active. Prospective work includes an addition to the structural shop and other work at the Boston navy yard at a cost of $731,500 and extensions to ways and shops, Portsmouth, N. H.

Philadelphia—New structural jobs are decidedly scarce. Fabricating shops are currently living mostly off order backlogs which are fairly substantial in some instances as a result of Pennsylvania state program. Work in southeast is confined to small amount of highway projects.

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Private work is slightly more active, but involves few jobs of any consequence.

Foreign mills are offering plain shapes $2.10 and $2.15 delivered, and bar mill shapes concession from $5 to $6.

San Francisco—No inquiries of size have developed and awards are limited to less than carload lots. Demand is the quietest experienced in many months with pending business not exceeding 1700 tons. The largest inquiry calls for 625 tons for the United States Engineer office, San Francisco. To date this year 44,860 tons have been placed, compared with 94,963 tons in 1937.

Seattle—Government projects are developing the only sizable tonnages as demand from private industry remains dull. Pacific Car & Foundry Co., Seattle, will furnish 560 tons, including machinery, involved in the Hylebos state bridge, Tacoma, Wash. The same fabricators are low bidders to Consolidated Builders, Inc., for eight spillway gates for the Coulee dam, involving 1000 tons.

Shape Awards Compared

	Tons
Week ended May 21	9,110
Week ended May 14	14,576
Week ended May 7	5,615
This week, 1937	22,610
Weekly average, year, 1937	16,060
Weekly average, 1938	15,676
Weekly average, April	24,340
Total to date, 1937	557,388
Total to date, 1938	329,190

Includes awards of 100 tons or more.

Shape Contracts Placed

1710 tons, power plant, Comstock, Mich., for Consumers Power Co., Jackson, Mich., to American Bridge Co., Pittsburgh.

1100 tons, Italian pavilion, World's fair, New York, to Bethlehem Steel Co., Bethlehem, Pa.

820 tons, Belgium building, World's fair, to Ateliers De Baine-Le Conte, Belgium.

800 tons, Memorial Union building, University of Wisconsin, Madison, Wis., to Duffin Iron Co., Chicago.

785 tons, state office building, Denver, to Burkhardt & Sons Steel & Iron Works Co., Denver.

617 tons, Wickford Junction railroad bridge, North Kingston, R. I., to Wisconsin Bridge Co., Milwaukee; Richard White, Inc., Boston, general contractor.

560 tons, including machinery, Hylebos state bridge, Tacoma, Wash., to Pacific Car & Foundry Co., Seattle; General Construction Co., Seattle, general contractor.

265 tons, press building, Color Printing Co., Waterbury, Conn., to Bethlehem Steel Fabricators Inc., New York; through Topper & Griggs, New York.

260 tons, Lenox vocational school, Washington, to Lehigh Structural Steel Co., Allentown, Pa.

230 tons, bridge 270.11, Goodman, Wis., to Bethlehem Steel Corp., Bethlehem, Pa.

200 tons, heater building, Sun Oil Co., Marcus Hook, Pa., to Belmont Iron Works, Philadelphia.

175 tons, 238th street bridge, Bronx, N. Y., to American Bridge Co., Pittsburgh; through Kinny & Finnerty Inc., New York.

170 tons, alterations to Georgia-Randolph building, Chesapeake & Potomac Telephone Co., Washington, to Barber & Ross Co. Inc., Washington.

150 tons, armory, Manchester, N. H., to New England Structural Co., Everett, Mass.

138 tons, bridge, Berks county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, bridge FAS-10-2, Barry county, Missouri, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.

130 tons, state bridge 170, Martell, Wis., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, state bridge 371, Galesville, Wis., to Lakeside Bridge & Steel Co., Milwaukee.

115 tons, 60 and 50-foot bridge spans, Pawnee City, Nebr., to Omaha Steel Works, Omaha, Nebr.

105 tons, building, Norma-Hoffmann Bearings Corp., Stamford, Conn., to Connecticut Iron Works, Stamford.

100 tons, store, Montgomery Ward Co., Rome, Ga., to Southern Engineering Co., Charlotte, N. C.

100 tons, underpass, Cerro Gordo county, Iowa, to Fort Pitt Bridge Works, Pittsburgh.

100 tons, estimated, bridges, McKinley Park, Haines and Eagle, Alaska, to Milwaukee Bridge Co., Milwaukee, 4.11c, fabricated and delivered; bids March 25. Contract also includes steel castings, forgings, bolts, pins and miscellaneous material.

Shape Contracts Pending

8800 tons, plant addition, bureau printing and engraving, Washington; previously reported at 4000 tons.

3500 tons, Pensacola dam, Grand River authority, Disney, Okla.

2100 tons, spillway gates and trash racks, Chickamauga dam, Tennessee Valley authority.

1000 tons, eight spillway gates, Coulee dam, for Consolidated Builders Inc.; Pacific Car & Foundry Co., Seattle, low.

700 tons, steel sheet piling, bulkhead, contract 2180, North Beach airport, Flushing Bay, Queens, N. Y.; bids May 24, department of docks, New York.

550 tons, estimated post office and courthouse St. Joseph, Mo., bids June 24.

430 tons, factory addition, Link Belt Co., Indianapolis.

420 tons, high school gymnasium and auditorium, Pocatello, Idaho.

300 tons, condenser and exchanger supports, Sun Oil Co., Marcus Hook, Pa., and Toledo, O.

300 tons, dam gates, Fort Peck, Mont.

255 tons, building, Eastern Color Printing Co., Waterbury, Conn.

250 tons, store building, H. L. Green, Columbus, O.

250 tons, remodeling building, S. S. Kresge Co., Detroit.

200 tons, building, Y. M. C. A., Springfield, O.

200 tons, school, Rushville, N. Y.

180 tons, store building, S. H. Kress Co., Ashland, Ky.

133 tons, Bondville and Rawsonville bridges, Winhall and Jamaica, Vt.; Sawyer & Swett, Winchester, N. H., low, $35,740.35; bids May 13, Montpelier, Vt.

130 tons, shop building and laundry building, W. Haverstraw, N. Y., for state.

120 tons, Clark street bridge, Jersey City; bids June 1.

100 tons, bridges, Houlton and Farmington, Me.; bids June 1, Maine state highway commission, Augusta.

Unstated tonnage, valves, crane and gate hoists, for Glendive, Mont., project, and Ponoma siphon, Washington state; bids to bureau of reclamation, Denver, May 31 and June 1, respectively.

Unstated tonnage, five radio towers for Eugene, Oreg.; bids to bureau of air commerce, Washington, May 24.

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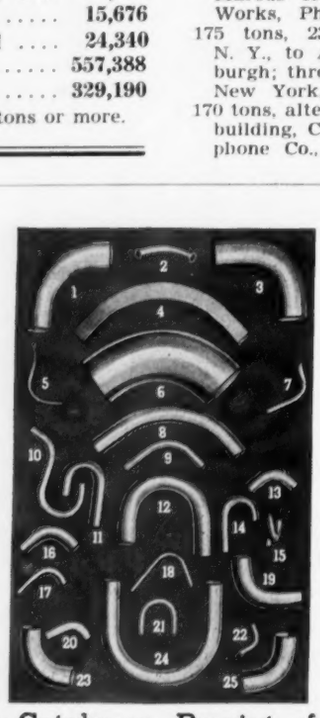

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Reinforcing

Reinforcing Bar Prices, Page 71

New York—Reinforcing contracts approximate 2100 tons, including 1330 tons for an approach for George Washington bridge, New York. Reinforcing highway mesh buying is active with new inquiry coming out heavier, including large lots involved in the opening, June 2, Albany. Piling being figured includes 700 tons, bulkhead, Flushing Bay, Queens, N. Y. closing May 24.

Although not likely to be bought for some time, close to 40,000 tons of bars and miscellaneous reinforcing steel will be required for housing projects in New York, including the Red Hook, Queensbridge and Metropolitan Life developments.

Boston—With most of the larger pending reinforcing steel projects bought, awards are limited to numerous small lots, 375 tons for Springfield, Mass., sewage pumping projects and several hundred tons for Connecticut highways being exceptions. More small bridge inquiries are active, but few take as much as 50 tons each. Additional weakness has developed in prices on some recent business.

Pittsburgh — Activity in reinforcing steel is slow, although several large projects are in the formative stage. Small orders represent the largest part of current business. Reaffirmation of present prices for the third quarter may speed action on some contemplated projects. Price weaknesses are reported clearing up in many sections.

Cleveland—Demand for reinforcing bars is limited to small miscellaneous tonnages. Considerable public work is still pending. Fabricators continue to operate on one or two day weekly schedules. Producers are expected to follow Carnegie's lead in extending prices unchanged into third quarter.

Chicago — A fairly large tonnage is pending though most new inquiries are small. Among new work is 310 tons for a Chicago sanitary district sewage disposal plant. Closing on 1500 tons for the Racine avenue pumping station here removes the largest local item from the pending list. Awarding of bars on a recent inquiry for Illinois road work has been deferred and new bids may be requested.

Philadelphia—The reinforcing bar market is practically devoid of activity, other than the bureau printing and engraving addition, Washington, taking 2450 tons. Bids on Washington job have been extended to May 27 from May 20. Roadwork is extremely disappointing and private construction has not appeared in volume previously anticipated.

San Francisco—Demand for reinforcing bars has shown some improvement and over 5000 tons are now either up for figures or pending. Awards totaled 1908 tons and brought the aggregate to 39,840 tons for the year, compared with 34,193 tons a year ago. Colorado Fuel & Iron Co., Denver, was awarded three projects by the bureau of reclamation for delivery at Parco, Wyo., Phoenix, Ariz. and Ignacio, Colo. Outstanding among the inquiries is 1669 tons for the United States Indian Irrigation service, Los Angeles, up for bids on June 6.

Seattle—No improvement is noted in demand, which is far below levels of a year ago. Operations of rolling mills are sharply reduced, with inquiry from private sources nonexistent. The week's awards total about 800 tons.

Concrete Bars Compared

	Tons
Week ended May 21	7,204
Week ended May 14	7,772
Week ended May 7	2,904
This week, 1937	4,178
Weekly average, year, 1937	6,266
Weekly average, 1938	5,782
Weekly average, April	8,512
Total to date, 1937	103,512
Total to date, 1938	121,426

Includes awards of 100 tons or more.

Reinforcing Steel Awards

1500 tons, Racine avenue pumping station, Chicago sanitary district, to Ceco Steel Products Corp., Chicago.

1330 tons, approach alterations, widening and ramps, George Washington bridge, New York side, to Igoe Bros., Newark; Walter Kidde Constructors, Inc., New York, general contractor.

450 tons, board of light and water department, Lansing, Mich., to Jarvis Engineering Co., Lansing.

375 tons, mesh, highway project RC-3936, Old Post road, Ulster county, New York, to Wickwire-Spencer Steel Co., New York; A. E. Ottaviano, Inc., Croton-on-Hudson, N. Y., general contractor, $351,700, bid April 26.

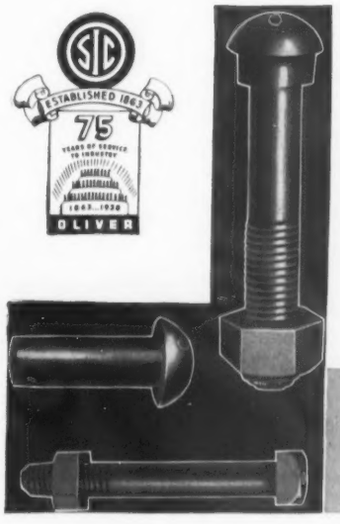
375 tons, Manhattan land section, Queens mid-town tunnel, New York, to Seaboard Steel Products Co., New York; Woodcrest Construction Co., New York, general contractor.

300 tons, hospital, Ann Arbor, Mich., to Joseph T. Ryerson & Sons, Chicago.

284 tons, United States engineer office, invitation 868-38-141, San Francisco, to Soule Steel Co., San Francisco.

278 tons, state underpass, Missoula,

Oliver



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Mont., to Bethlehem Steel Co., Seattle; J. C. Bosspflug, Great Falls, general contractor.

250 tons, sewers, Akron, O., to West Virginia Rail Co., Huntington, W. Va.

220 tons, Hylebos state bridge, Tacoma, Wash., to Northwest Steel Rolling Mills, Seattle; General Construction Co., Seattle, general contractor.

200 tons, building, Marin-Dell Dairy Co., San Francisco, to Gilmore Steel & Supply Co., San Francisco.

195 tons, building, Ford Motor Co., world's fair, New York, to Bethlehem Steel Co., Bethlehem, Pa., Hegeman Harris Co., Inc., New York, general contractor, through Wilcox Construction Co., New York, sub-contractor.

180 tons, mesh, highway project 8498-A, Little Falls-High Level, Herkimer county, New York, to Wickwire-Spencer Steel Co., New York; Dale Engineering Co., Utica, N. Y., general contractor, $172,722.20, bid April 26.

177 tons, bureau of reclamation, invitation 32,036-A, Ignacio, Colo., to Colorado Fuel & Iron Corp., Pueblo, Colo.

175 tons, bureau of reclamation, invitation A-22,318-A, Parco, Wyo., to Colorado Fuel & Iron Corp., Pueblo, Colo.

150 tons, Washington state highway projects, to Northwest Steel Rolling Mills, Seattle.

150 tons, sub-structure, river spans, bridge, Sayreville-Woodbridge, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; P. F. Connolly Co., Long Island City, N. Y., general contractor.

150 tons, high school, Moscow, Idaho, to Truscon Steel Co., Portland, Oreg.; Colonial Construction Co., Spokane, general contractor.

140 tons, high school building, El Monte, Calif., to unnamed interest.

125 tons, building, Exchange Orange Products Co., Ontario, Calif., to unnamed interest.

100 tons, pumping station, Green Bay, Wis., to W. H. Pipkorn, Milwaukee.

100 tons, bureau of reclamation, invitation 42,835-A, Phoenix, Ariz., to Colorado Fuel & Iron Corp., Pueblo, Colo.

★

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Reinforcing Steel Pending

2450 tons, plant addition, bureau printing and engraving, Washington; bids May 27.

1669 tons, United States Indian Irrigation Service, Los Angeles, specification QQ-B 71; bids June 6.

600 tons, Government hospital, Murfreesboro, Tenn.; bids May 17.

334 tons, highway work and bridges, Merced county, California, for state; bids May 25.

310 tons, section KK, Stickney sewage disposal plant, Chicago sanitary district; bids June 9.

300 tons, supply canal, Central Nebraska public power and irrigation district, Hastings, Nebr.

250 tons, intercepting sewer, Bronx, N. Y.; Arthur A. Johnson Corp., New York, low.

250 tons, mostly mesh, highway, Norwalk and Westport, Conn.; New Haven Road Construction Co., New Haven, Conn., low.

215 tons, mostly mesh, highway, Hamden and North Haven, Conn.; L. Suzio Construction Co., Meriden, Conn., low.

133 tons, bureau of reclamation, invitation 27,578-A, Charleston, Utah; bids May 24.

130 tons, two bridges, Calaveras county, California, for state; bids June 1.

125 tons, bureau of reclamation, Denver, bids May 24, schedule 27518-A.

Cold-Finished

Cold Finished Prices, Page 71

Pittsburgh — Warehouse orders comprise the most important factor in the present cold-finished steel market. Most important of these are orders for restocking popular sizes, which are being depleted by small orders from manufacturers. Some few shipments are being made direct to manufacturing plants on jobber orders but these are unimportant in the total picture. The farm implement group has slipped from first to second place among the tonnage takers and automotive releases are small and insignificant. Prices have been reaffirmed for third quarter, and although this is not expected to bring in any volume of business, it will aid in releasing some orders which have been held up because of uncertainty.

Pig Iron

Pig Iron Prices, Page 72

Boston — Small-lot buying for prompt delivery is slightly more active, although aggregate volume of pig iron for shipment through June is not impressive. There are indications, however, that more consumers are low on iron stocks even considering current light melt. There is nothing immediately ahead which would indicate much gain during the early summer months. Foundries connected with textile machinery plants are operating at a low rate.

The New England producer has reaffirmed pig iron prices for third quarter at second quarter level.

Pittsburgh — Pig iron producers are expected to reaffirm prices for third quarter deliveries within the next few days. Possibility of any change in prices is discounted in view of the fact that iron users are not interested in tonnages at any price and a cut would not serve to bring out any type of orders. The markets are exceedingly dull with only a few scattered carloads moving.

Cleveland—Pig iron sellers report the general run of miscellaneous orders continue substantially unchanged, reflecting only actual needs and requesting prompt deliveries. No improvement is noted in requirements from auto foundries and railroad equipment foundries. Agricultural equipment needs show signs of easing.

Chicago — Pig iron shipments are holding at about the rate of a month ago and sellers anticipate only minor changes during next 60 days. Operations of some foundries still are declining seasonally in some instances, the farm equipment industry being affected in this respect. Announcement of third quarter prices is expected shortly, with the trade looking for an extension of the current market of $24, furnace, for No. 2 foundry and malleable.

New York — Pig iron consumers buying cautiously pending official action with respect to third quarter

quotations. Export orders are negligible, although some scattered inquiry for relatively small lots is still pending.

Philadelphia — Pig iron melters continue to buy for current needs only. Foundry operations average about the same as for several weeks. Large consumers have substantial stocks. The decline in scrap has become a more competitive factor.

Buffalo — Pig iron releases continue light. An occasional carlot order is reported but no forward contracting is being placed by consumers. With prices generally holding steady, no changes are expected in present ranges for the third quarter.

Cincinnati — Shipments of pig iron hold to March and April levels. The seasonal melt for heating equipment has been curtailed and jobbing foundry operations are almost uniformly light. Inventories are down to a point where even the larger operators demand rush shipments when needs arise.

St. Louis—Melt is declining. New buying is in small volume and for prompt delivery. Inquiry for third quarter is negligible.

Toronto, Ont.—While there has been comparatively little change in actual business, outlook has brightened with announcement of nearly $100,000,000 to be spent in Canada on war materials including airplanes, machine guns, munitions, etc. Contracts will be placed by Canadian, British and French governments. Current pig iron sales are holding to lots of 50 to 300 tons with occasional orders up to 500 tons and weekly totals around 2000 tons. Melters, however, are showing more interest in the market and inquiries are increasing.

Scrap

Scrap Prices, Page 74

Pittsburgh—Scrap is weaker and the price is 50 cents a ton lower on No. 1 steel and sympathetically on open-hearth grades, following small sales. However, the quoted price does not represent the total market as there seems little doubt that larger tonnages would command a somewhat higher price as a result of unwillingness to sell at today's lower prices on the part of many scrap dealers whose stocks were laid at higher levels. Railroad specialties are weaker and the whole list has suffered sympathetically, although most quoted prices are nominal.

Cleveland — So little volume movement of iron and steel scrap is noted that the trade seems to have approached almost a standstill. Some cast material is moving but the borings movement seems to have expired due to blast furnaces blowing out.

Chicago—Scrap prices are easier and quotations on various grades are down 25 cents to $1 a ton. Heavy melting steel is nominal in the absence of mill purchases, following a sale a short time ago at $11.50.

Boston—Small sales of foundry grades at lower prices account for the only activity in iron and steel scrap. For delivery nearby No. 1 machinery has sold as low as $11 and textile from $11.50 to $12.50. These prices reflect transactions in distress material held by smaller dealers. Steelmaking grades for domestic consumption are inactive, little or no material moving to district or Pennsylvania mills.

New York — Iron and steel scrap buying is at a low point, only a few foundry grades moving in small shipments. Prices for domestic shipment, while mostly nominal, have not weakened further. For barge delivery, export, however, brokers in most instances have marked No. 1 heavy melting steel down to $8.50, barge, paying $7.00 for No. 2.

Philadelphia — The scrap market apparently has flattened, although some further reductions, particularly in cast grades, have been made. Distress lots of No. 1 steel have moved at $12 but both buyers and sellers admit that tonnage could not be bought at less than $12.50. Scrap is not coming out and yard men are not pressing for sales. No. 2 steel is moving to two points at $9.50 to $10, although a third consumer is offering only $8.50. Export business is practically cleared up with only one cargo scheduled for Italy.

Buffalo — No sales of iron and steel scrap have been negotiated at the reduced bids placed in the market a week ago by the leading consumer.

Detroit — While some complaints are heard that local prices have been unduly depressed by dealers anxious to stock yards at low prices, careful check indicates this is not the case, and that consensus of opinion expects further general reduction.

Cincinnati — Scrap sales are so light and infrequent that prices are without test, at the same time showing further weakness in sympathy with nearby markets. Mill steelmaking is still being sustained from scrap inventory, although one interest is taking in moderate tonnages where advantageous.

St. Louis—Trading in iron and steel scrap has receded to the lowest volume so recorded in the present decline. Mills evince utter lack of interest in supplies, several being well stocked and others being willing to take a chance in the open market when necessity arises. For the most part prices are nominally unchanged, the only revisions being to eliminate differentials between this market and other consuming points, all downward.

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Warehouse

Warehouse Prices, Page 73

Pittsburgh — Warehousemen report slight slowing up in orders. Stocks of practically all manufacturers are at bottom and orders now being received by the warehouses represent buying for current production schedules. Prices have weakened in isolated cases here, although many inquiries for lower prices have met with no success.

Cleveland—Distributors note little change in general run of miscellaneous orders. Total tonnage involved remains disappointing, but order volume continues at comparatively satisfactory levels. Outlook for the remainder of the month is somewhat discouraging, with some distributors predicting a decline of about 10 per cent in shipments.

Chicago—Sales show little change and while volume is off moderately from the rate a month ago, decrease has been no larger than usually experienced at this period. Warehouses are expected to follow mills' lead in setting third quarter prices. Quotations generally have been steady.

Boston — Warehouse volume is at about the April rate with most jobbers in the metropolitan district. At other distributing points tonnage sales vary widely, several in Maine reporting demand well sustained. Even in the Boston area a few sellers claim volume is close to last year thus far, while others are not doing much better than 60 to 70 per cent of 1937 totals.

New York—Steel warehouse sales are generally for small lots, tonnage shipments being light and aggregate volume slightly under last month. Specialties are moving slowly and the usual spring bulge in building requirements is less than normal. In sheets, galvanized are being sold in fair volume, but frequently at prices which have severely shaken the market for that commodity.

Philadelphia—Jobber sales are estimated roughly at 60 per cent of normal, considerably above the mill volume. May is not as active as in April, so far, though the total number of orders is about the same with smaller tonnage.

Detroit—Jobber volume for the May-June period, normally above the preceding two months, likely will dip this year as retooling and plant rearrangement programs are held up or canceled. Some easiness is noted in galvanized sheets, one offer of 3.60c against the present base of 3.80c being reported.

Cincinnati—The number of warehouse sales is being well maintained although the conservative, lighter buying tends toward decreased tonnage. Items with Cleveland base are unchanged but delivered prices on others are down one cent per 100 pounds on a freight rate readjustment.

St. Louis—Warehousemen report a sales recession in May, with practically all lines affected. General manufacturing demand failed to show stimulus of spring influences, and peak of the season is past. There is a fair movement of railroad shop materials.

Seattle—Warehouse turnover is keeping pace with that of a month ago but volume of business is below seasonal normals. Orders are in small tonnages, mostly out of stock. Sheets are in best demand. Government agencies are buying lightly with the fiscal year closing. Prices are unchanged and generally are maintained.

Steel in Europe

Foreign Steel Prices, Page 73

London — (*By Radio*) — Imports of steel and iron into Great Britain in April were 61,469 tons, compared with 276,785 tons in March. This precipitate fall was caused by restricted demand following increasing stocks by domestic consumers and measures taken by the Steel Federation to restrict buying of foreign products. Exports in April were 168,318 tons, which compares with 179,100 tons in March.

Markets are dull and stocks of pig iron are increasing. Apart from mills producing heavy steel, which are still active on accumulated orders, the outlook for steel production is clouded. Export trade is dull, although inquiry tends to expand. Trade in tin plate is dull and galvanized sheets are depressed.

The Continent reports export trade is quiet except to the Far East, where activity continues. Competition by American producers is reappearing.

Exportation of iron ore from Australia after July 1 has been prohibited by the government. This followed a report by the geological adviser that accessible deposits are so limited as to compel conservation for domestic industrial requirements.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Third quarter prices on bolts and nuts are expected to reaffirm without change within a few days. Producers have schedules under consideration and general sentiment is that no change will be made.

Chicago—Demand continues at a slow rate and producers look for continuation of slow buying through the summer. Farm equipment builders show seasonal decrease in schedules but still take material at a moderate rate. Some railroads, with federal loans, may buy equipment in moderate amounts but otherwise show little sign of increasing re-

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CLAUDE H. BENNETT, *General Manager*

quirements materially. Rivet prices are fairly steady; bolt and nut prices are still irregular.

Iron Ore

Iron Ore Prices, Page 74

New York — Tungsten ore, which among ores has been the most active performer pricewise over recent months, is holding unchanged at the moment, Chinese wolframite being quoted nominally at $15.75, duty paid, per short ton unit.

High grade Caucasian and South African manganese ore is holding nominally at 45 cents per unit, without duty, Atlantic ports, and foreign iron ores are also nominally unchanged in the absence of any buying interest here.

Contributing to this unchanged situation here are fairly sustained volume of sales abroad and apparent recognition by importers here that anything like normal concessions would fail to stimulate buying in this country, in view of continued heavy stocks.

Cleveland—Lake Superior iron ore consumed by blast furnaces during April was 1,853,658 gross tons, according to the Lake Superior Iron Ore association. This was slightly less than the 1,980,182 gross tons consumed in the preceding month and considerable below the 5,114,177 consumed in April of last year.

Ore prices have not yet been established.

Reader Comments

(*Concluded from Page* 9)

buyer, that the salesman through untiring work not only creates the desire to own the products made by other men, but provides the employment that furnishes a still greater market for the countless products of farm and factory. Thus, the salesman is one of the most important men in America today, possessed of the power, if he acts in concert with his fellow salesmen, to help this country back to prosperity.

The task, as we see it, is turning the business wheel past dead center, and we believe this is the salesman's job. We believe further that there are plenty of people left with the ability and the willingness to buy if the salesman presents his product so as to awaken a desire for ownership stronger than the fears that have kept people from satisfying their normal needs.

Lincoln, Neb., was selected as a proving ground for our belief. On Wednesday, May 18, at a breakfast meeting of Kelvinator selling men, we launched a movement called the national salesmen's crusade, the slogan of which is "Sales Mean Jobs." Immediately after the meeting, we set out, Nash-Kelvinator executives and salesmen, to prove in Lincoln and the surrounding territory that sound, persistent selling methods are effective today, as they always have been. This activity will be the forerunner of a nationwide campaign, in the Kelvinator organization, based on this principle.

G. W. Mason

President,
Nash-Kelvinator Corp.,
Detroit.

Nonferrous Metals

Nonferrous Metal Prices, Page 90

New York — A steady weakening in the foreign copper market last week coupled with poor buyng support culminated in a one-cent decline in electrolytic here on Thursday to the 9-cent level. Tin slumped to new low ground while zinc and lead held unchanged in quiet markets.

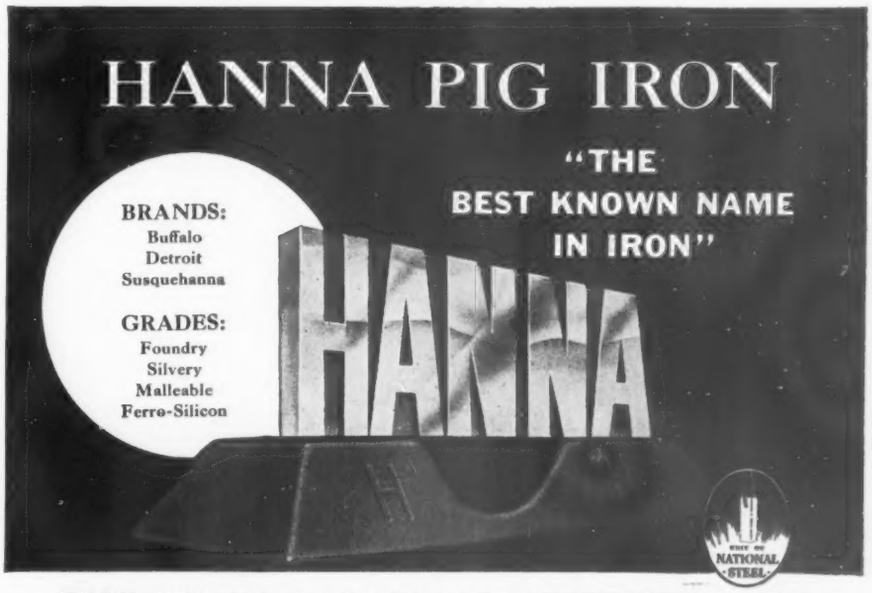
Copper — Smelters were unable to sell in the foreign market at levels prevailing here earlier in the week, resultng in their posting a 1-cent cut on Thursday. This new basis of 9.00c, Connecticut, for electrolytic, was met immediately by mine producers. Brass ingot prices eased ¾ to 1¼ cents; copper wire and cable declined ¾ to 1 cent; while smelters lowered bids for copper and brass scrap ¾-cent on Thursday and ¼-cent further on Friday to the bass of 7.25c for No. 1 heavy copper. The latter decline was due to a further drop in export copper to a low of 8.70c, c.i.f. European ports. Buying in the primary market was light at the new level and the undertone was still weak at the close.

Tin — Reflecting partly the lack of consumer demand and partly the decline in copper, tin prices dropped to new low ground with Straits spot closing at 35.90c. All interests awaited the result of the Malayan referendum on the buffer pool question.

Lead — Sellers appear resigned to a continuation of light new business while consumers continue to withdraw paid-up stocks at refineries. Prices were unchanged at 4.35c, East St. Louis, and 4.50c, New York.

Zinc — The market remained in an anomalous position. Demand for futures exceeded offerings while demand for the ample supplies of nearby metal was light. Prime western held at 4.00c, East St. Louis.

Antimony — American Smelting & Refining Co. expects to start production of antimony at its new refinery at Perth Amboy, N. J., late this month. Prices eased ½-cent on Tuesday to 12.25c, New York, for American spot and nominally 14.75c, duty paid New York, for Chinese spot.



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Equipment

New York—Machine tool orders for single units are spasmodic. One or two tools from lists previously figured are placed, with considerable of the original inquiry held in abeyance. There is little new inquiry except for government shop needs. Much current business is for replacement, but such orders are for units badly needed, although curtailed operations in most metalworking industries limits volume. Shipyards, with a large tonnage to be built soon, are operating with much obsolete equipment and several have considered new equipment purchases without making definite inquiry. Plants connected with the airplane industry are active, but most of these are well equipped. Railroads are buying practically nothing.

Boston—Shops building metalworking machines for foreign purchasers are operating close to 30 hours per week on an average. Those depending on domestic orders are less active. Builders of textile and shoe manufacturing machinery are on shortest schedules. Several large textile equipment plants are down to the 1932-33 level with large inquiries held up. Government shop orders and inquiry continue to trickle in, Brown & Sharpe Mfg. Co., Providence, R. I., booking milling machines and spares for Brooklyn and Philadelphia navy yards, opening of April 15. Such inquiry includes four automatic single spindle screw machines for Newport, R. I., two heavy duty engine lathes, Portsmouth, N. H., and an overhead bridge crane, Norfolk, Va. Lack of buying by the automobile industry has slowed down production of bearings at numerous plants, although industrial bearings are making a relatively better showing.

Cleveland — Machine tool and equipment orders are improving spottily, although a marked upturn is not expected before September. Automotive partsmakers are beginning to release in better volume. It has been estimated the parts industry here has taken only about 20 per cent of its normal requirements, when ordinarily about 70 per cent would have been shipped at this time. Fair-sized orders have been placed recently by the electrical and automotive industry, while the chemical industry supplies a steady outlet for miscellaneous units. No large lists are pending.

Tool builders generally still have good backlogs of export business, largely for Russia and England with an increasing amount for Italy. These backlogs in some cases extend three to six months. Deliveries on domestic business may be had promptly.

Chicago — While sales are slow, machinery and equipment sellers see a fairly large volume of potential business which is likely to be released upon any definite recovery in the general outlook. Orders lately have been barely sufficient to support buying at the rate of the previous several weeks, but it is expected that a relatively steady trend will prevail the next 30 to 60 days. Railroads appear to be definitely out of the market for major types of equipment for the near future. Some machine tools still are pending for railroad shops, but closing on these items has been deferred until summer.

Knoxville, Tenn.—Tennessee Valley Authority closes June 2 on two 20-ton gantry cranes with lifting beams and track bumpers for the Guntersville and Chickamauga dam power plants.

Seattle—Road machinery items continue in active demand with electrical equipment also moving in good volume. Industrial plants are hesitating to make replacements and labor disputes in the salmon and vegetable canning industries have reduced normal volume of purchases. Mining machinery is moving well but logging and lumbering are lagging as operations have been reduced to about 46 per cent of the 1926-29 level. Hesse-Ersted Iron Works, Portland, is low at $7500 for furnishing winches, motors and drums for municipal terminal No. 1 Portland, Oreg. Seattle port commission has received bids for a freezing plant at Spokane street terminal, Everett, Wash., and has awarded a contract to Van S. McKenny, Seattle, for an ornamental lighting system, steel poles specified. Washington state has purchased two patrol graders and a 6-ton roller. Yakima county, Wash., has bought a diesel patrol grader. Bremerton, Wash. opens bids May 28 for a sewer system involving pump equipment.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

May	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
14	10.00	10.12½	9.52½	38.00	38.15	4.50	4.35	4.00	20.00	12.75	35.00
16	10.00	10.12½	9.52½	37.15	37.30	4.50	4.35	4.00	20.00	12.75	35.00
17	10.00	10.12½	9.52½	36.35	36.50	4.50	4.35	4.00	20.00	12.25	35.00
18	10.00	10.12½	9.52½	36.65	36.80	4.50	4.35	4.00	20.00	12.25	35.00
19	9.00	9.12½	8.52½	36.60	36.75	4.50	4.35	4.00	20.00	12.25	35.00
20	9.09	9.12½	8.52½	35.90	36.05	4.50	4.35	4.00	20.00	12.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper

Sheets

*Yellow brass (high)	15.62½
*Copper, hot rolled	17.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	9.75

Tubes

*High, yellow brass	18.37½
*Seamless copper	17.62½

Rods

*High yellow brass	11.62½
*Copper, hot rolled	13.62½

Anodes

Copper, untrimmed	15.37½

Wire

*Yellow brass (high)	15.87½

OLD METALS

Nom. Del. buying prices

No 1 Composition Red Brass

*New York	5.72½-5.85
*Cleveland	5.75-6.00
*Chicago	5.00-5.25
*St. Louis	5.12½-5.37½

Heavy Copper and Wire

*New York, No. 1	6.62½-6.87½
*Cleveland, No. 1	6.25-6.50
*Chicago, No. 1	6.25-6.50
*St. Louis	6.25-6.50

Composition Brass Borings

*New York	5.35-5.47½

Light Copper

*New York	5.12½-5.37½
*Cleveland	4.50-4.75
*Chicago	4.25-4.50
*St. Louis	4.50-4.75

Light Brass

*Cleveland	2.75-3.00
*Chicago	2.75-3.00
*St. Louis	2.75-3.00

Lead

New York	3.50-3.75
Cleveland	3.25-3.50
Chicago	3.00-3.25
St. Louis	2.75-3.00

Zinc

New York	1.75-1.87½
Cleveland	1.75-2.00
St. Louis	1.75-2.00

Aluminum

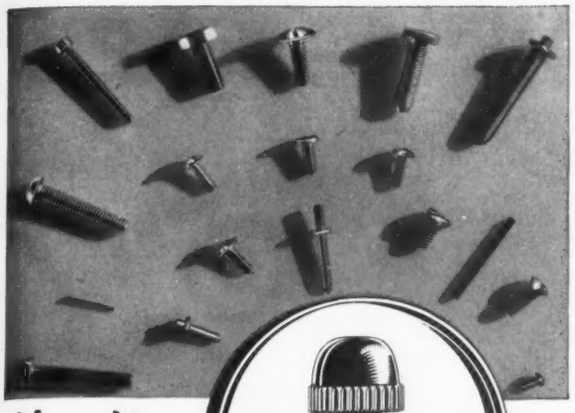
*Borings, Cleveland	4.75-5.00
Mixed, cast, Cleveland	6.75-7.00
Clips, soft, Cleveland	11.25-11.50
Mixed cast, St. Louis	7.00-7.25

SECONDARY METALS

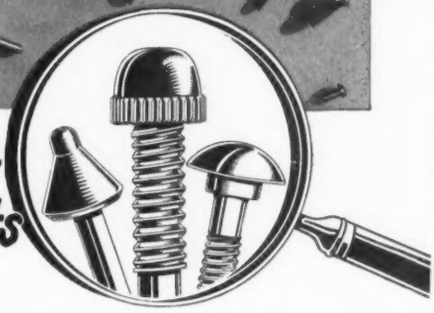
*Brass ingot, 85-5-5-5, less carloads	9.25
Standard No. 12 aluminum	14.25-14.75

Navy Buys Brass

Boston—Bristol Brass Corp., Bristol, Conn., has been awarded contract for 85,750 pounds, commercial brass, for the naval station, Newport, R. I., at $7849.44, delivered, and for 25,300 pounds, naval brass, for the same station at $2566.57, bids April 29. Under the same schedule, United Wire & Supply Corp., Providence, R. I., booked 18,750 pounds, brass tubing, at 26.85c and Scovill Mfg. Co., Waterbury, Conn., took 300,000 brass tubes at 4.39c each.



Heading Specialists



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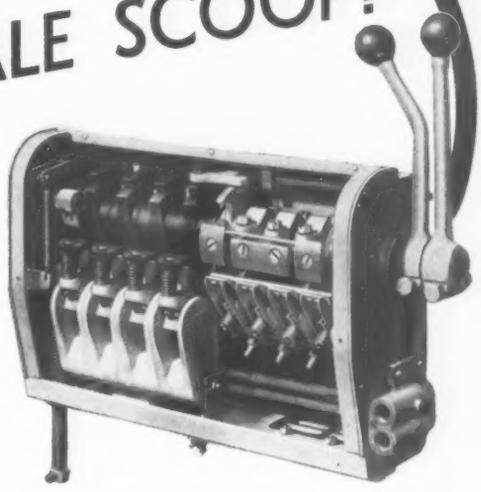

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Minnesota

ALBERT LEA, MINN. — Albert Lea Food Products Co. plans installation of power equipment in connection with rebuilding four-story grain elevator recently destroyed by fire. Will also install hoisting, conveying and other mechanical handling equipment.

BLUE EARTH, MINN.—Funds have been assured by the REA to the Faribault County Co-operative Electric association, Carl Schneider, project superintendent, for construction of 100 miles of additional transmission lines. Wendell W. Cutcliffe is engineer.

CHISHOLM, MINN.—City, F. W. Hurt, city clerk, is considering erection of a municipal light and power plant costing $647,000, and has applied to PWA.

KEEWATIN, MINN.—City, John Rebrovich, city clerk, voted in favor of a $55,000 bond issue to finance remodeling of municipal steam heating plant. City will seek WPA funds.

LUVERNE, MINN. — Clyde Stephen plans addition to plant to be equipped as a cold storage and refrigerating unit. Cost close to $30,000 with equipment.

MILACA, MINN.—Rum River Co-operative Light & Power Co., Herman Halvorsen, secretary, has filed application with REA for construction of 350 miles of rural transmission lines in Mille Lacs, Kanabec and Isanti counties.

ST. CLOUD, MINN.—Northern States Power Co., Wheelock Whitney, division manager, is preparing plans to replace generator unit, construct new transmission lines, rebuild substations, install lightning arrestor and enlarge building, at a cost of about $200,000.

ST. PAUL, MINN.—University of Minnesota, R. S. Callaway, purchasing agent, Administration building, is taking bids to May 28, 10 a. m., for two new pulverizers and brick work changes on two Babcock & Wilcox 350-horsepower boilers at the farm power plant.

TRUMAN, MINN.—City, R. L. Krause, city clerk, will hold a special election May 23 to vote on a $50,000 bond issue to finance constructiion of municipal light and power plant, costing $104,000. (Noted May 2).

WARROAD, MINN.—Warroad Co-operative Creamery plans cold storage and refrigerating plant. Financing being arranged. Cost about $30,000.

Connecticut

NEW HAVEN, CONN.—United Illuminating Co., New Haven, has plans for new indoor power substation on George street and will begin work soon. Cost estimated over $75,000 with equipment. R. W. Foote, 185 Church street, New Haven, engineer.

WEST HAVEN, CONN. — Armstrong Rubber Co. will erect a boiler plant at its new mill in Natchez, Miss., for manufacturing automobile tires.

Massachusetts

WORCESTER, MASS.—Norton Co., New Bond street, plans installation of electric power equipment in new four-story addition to abrasive materials and refractory products plant. Cost $275,000. Adolph Johnson, 16 Norwich street, Worcester, is architect.

New York

NEW YORK—International Business Machines Corp. soon will begin construction of a modern $750,000 machine shop at its Endicott, N. Y., plant.

SYRACUSE, N. Y.—National Biscuit Co., 449 West Fourteenth street, New York, plans installation of power equipment in new baking plant here. Traveling ovens, conveyors and other mechanical equipment will be installed. Cost over $300,000.

Pennsylvania

PHILADELPHIA—George D. Wetherill & Co., Front and Cherry streets, will install power equipment in connection with rebuilding portion of plant damaged by fire.

Ohio

CLEVELAND — Independent Register Co., 3747 East Ninety-third street, manufacturer of heating registers, is erecting an addition to its plant for which the A. M. Higley Co., 2036 East Twenty-second street, is contractor, and the Carter-Richards Co., Engineers building, is architect and engineer.

CLEVELAND — Mackintosh Engineering Co., 2907 Library avenue, is in the market for a used 50-B Bucyrus-Erie or Marion 37 steam crawler crane; also a used 24 x 36-inch jaw crusher.

CINCINNATI — Orville Simpson Co., 1230 Knowlton street, is taking bids for erection of factory addition. Cost $50,000. S. Hannaford, Dixie Terminal building, is architect.

HILLSBORO, O. — Globe Chair Co. plans installation of electric power equipment in connection with rebuilding portion of plant recently destroyed by fire. A new boiler house will be built. Cost $45,000.

TOLEDO, O.—Toledo Vocational High school plans purchase of air compressors, air storage tank, blue print machine, auto mechanics and electrical shop equipment, motors, printing equipment and welding equipment. R. S. Wenzlau, director of schools, Toledo. Estimated cost $17,150. Bids opened June 1, docket OH-1076-D, by L. A. Boulay, associate regional director, federal emergency administration of public works, Columbus, O.

Michigan

CHARLEVOIX, MICH.—City is arranging financing through bond issue for municipal power plant costing about $200,000. Bids will be taken soon. Hamilton & Webber, Grand Rapids, Mich., consulting engineers.

HANCOCK, MICH.—City council has approved plans for remodeling and improving former municipal power house and installing equipment for municipal cold storage and refrigerating plant. Cost about $40,000, including machinery. Albert L. Ehler is city engineer.

Illinois

GENEVA, ILL.—City has plans maturing and will ask bids in June for erection of municipal electric generating station, costing over $150,000. Wells Engineering Co., Geneva, consulting engineer.

Indiana

INDIANAPOLIS—Coil Piston Ring Co. Inc., 616 North Illinois street, has been formed to manufacture piston rings and other automobile parts. Incorporators are: Elmer G. Martin, Robert J. Finlayson and Frank Payne.

ODON, IND.—Pumping machinery will be installed in new pump station here. A 60,000-gallon elevated steel tank and tower will also be purchased. Lennox & Mathews, Architects and Builders building, Indianapolis, consulting engineers.

District of Columbia

WASHINGTON — Bureau of supplies and accounts, navy department, will take bids until 10 a.m., May 27, schedule 3490, chain hoists, delivery Mare Island, Calif.; schedule 3491, chain hoists, delivery east and west coast points; schedule 3538, two motor-driven heavy duty engine lathes, delivery Portsmouth, N. H.; schedule 3543, one motor driven wet abrasive cut off machine, delivery Boston; schedule 3523, steel forgings for welding end fittings; schedule 3524, steel boiler tubes, delivery Brooklyn, N. Y.; schedule 3535, 12 portable pneumatic grinders, delivery Charleston, S. C.; schedule 3536, two motor-driven automatic profiling machines, delivery Washington; schedule 3537, one motor-driven all-geared drill, delivery Portsmouth, N. H.; schedule 3503, steel valves; schedule 3507, one bridge-type overhead electric traveling crane, delivery Norfolk, Va.; until May 31, schedule 3515, 150 sets flaring tools for tubing, delivery Philadelphia; schedule 3541, one diesel marine engine, delivery Puget Sound, Wash.; schedule 3545, marine diesel engine and auxiliary machine, delivery Mare Island, Calif.; schedule 3551, one electric arc welding set, delivery Brooklyn, N. Y.; schedule 3494, breast, hand and ratchet braces and drills.

WASHINGTON—Office of general purchasing officer, will open bids at 10:30 a.m., May 31, schedule, 3354, for magnet wire, welding rods, oxygen regulators, pressure gauges, steel and brass bolts, steel and brass nuts, steel rivets, lag screws, brass machine and wood screws, and bench-type grinding machine, delivery at Cristobal or Balboa.

Mississippi

STARKVILLE, MISS.—Regional PWA has received final plans and specifications for complete municipal power system, costing $75,000. Call for bids soon.

North Carolina

MORGANTON, N. C.—City has voted $200,000 water and electrical improvement bonds and $25,000 sewer bonds.

WILMINGTON, N. C. — Ethyl-Dow Chemical Co., Midland, Mich., subsidiary of Dow Chemical Co., Midland, plans installation of motors and controls, regulators, electric pumping machinery and other equipment in expansion of plant here. Additions will be built for which erection contract has been let to Austin Co., Cleveland. (Noted May 9)

Tennessee

CHATTANOOGA, TENN. — Electric power board has authorized purchase of two substation sites at cost of $25,000 and plans erection of steel structures and auxiliary equipment at cost of $98,000.

FAYETTEVILLE, TENN.—PWA approved plans and specifications for complete municipal electric distribution system, costing $115,000. Bids will be taken June 17. Lide & Adler, engineers, Woodward building, Birmingham, Ala.

MEMPHIS, TENN.—Memphis light and water commission is taking bids until May 26 for transformers, switchgear and other equipment for power substation in connection with new municipal electrical distributing system. Cost close to $500,000.

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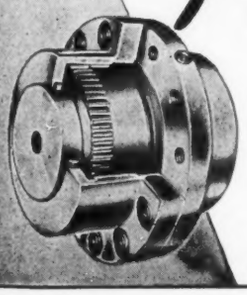

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Louisiana

HOUMA, LA.—City plans purchase and installation of diesel electric generator to be installed in power plant.

Virginia

RICHMOND, VA.—Richmond Engineering Co. Inc., Brook avenue, will spend approximately $60,000 on plant improvements. All engineering and individual contracts will be let through company's office.

ROANOKE, VA.—Appalachian Electric Power Co., Roanoke, has secured permission to acquire tract of about 16 acres on New River, Giles county, to be used as site for proposed new generating plant. Project will cost over $10,000,000.

WYTHEVILLE, VA.—Town, R. W. Arthur, acting town clerk, will vote June 14 on $80,000 bonds for filtration and water treating plant.

Arkansas

LITTLE ROCK, ARK.—Arctic Ice Co., Otis Nichols, head, plans one-story ice manufacturing and refrigerating plant. Cost $50,000.

Wisconsin

MILWAUKEE—Foote Mfg. Co., 1821 South First street, which has been conducting a wood and metal pattern business for many years, has entered the manufacture of tools, dies, special machinery, etc. Fred S. Foote is president.

BEAVER DAM, WIS.—Dodge county board plans application for WPA funds toward building new $20,000 highway garage and repair shop, 60 x 120 feet. L. A. Kohn is highway commissioner.

KEWASKUM, WIS. — Stainless Steel Inc. has been organized in Chicago by Harry B. Klusmeyer, former executive of Aluminum Products & Stainless Steel Products, La Grange, Ill., to specialize in stainless steel cooking utensils. At present production will be carried on in plant of Kewaskum Aluminum Co., here.

WATERTOWN, WIS.—Foundry and machine shop of the old Monarch Tractor Co. here has been taken over by a local group headed by Jack Davis and at present is specializing in manhole covers and other municipal supplies.

WEST BEND, WIS.—Pick Mfg. Co., maker of automobile replacement parts and accessories, has acquired Edde Mfg. Co., Milwaukee, specializing in automotive oil filters. Factories are being consolidated at West Bend. Carl Pick is president.

Texas

ATLANTA, TEX.—City has let contract at $10,000 to G. W. Fleener, Atlanta, Tex., for erection of canning plant. C. H. Leinbach, architect, North Texas building, Dallas, Tex.

HOUSTON, TEX.—Mosher Steel Co., 3910 Washington street, has contract for first unit of an oil tool manufacturing plant for Bryon-Jackson Co., Los Angeles; contract includes furnishing steel and erecting frame for the factory building, a one-story 60 x 350 feet structure. Contract for a two-story, air conditioned office building, 40 x 85 feet will be let soon. Total cost of building, equipment and land is $200,000. Will install all electric heat treatment furnaces.

Kansas

OKETO, KANS.—City, Earl Hedge, mayor, has received WPA approval for construction of a complete new waterworks system, including a 25,000-gallon tank and tower. Paulette & Wilson, 211 Farmers Union building, Salina, Kans., consulting engineers.

TROY, KANS.—Doniphan County Electric Co-operative, N. V. Wakeman, secretary, is completing plans for construction of 135 miles of rural electric lines of either copper or aluminum wire at a cost of about $120,000. E. T. Archer & Co., 609 New England building, Kansas City, Mo., consulting engineer.

Nebraska

GRAND ISLAND, NEBR.—City, F. S. White, city clerk, is taking bids to May 25, 8 p. m., on a 60,000-pound per hour boiler, superheater, waterwalls, air preheater, and pulverized fuel firing equipment for its power plant. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers. (Noted April 18).

OMAHA, NEBR.—City, Emmet Hannon, city clerk, is planning to build a sewage disposal plant. G. B. Gascoigne, Cleveland, is consulting engineer, and Harry Trustin, city engineer. (Noted April 2).

ORD, NEBR.—North Loup Hydro-Electric & Irrigation district, M. P. Barta, secretary, is taking bids to June 3, 10 a. m., on construction of a 16-mile, 34.5 kilowatt power transmission line, metering equipment and voltage regulators. Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers.

TEKAMAH, NEBR.—Burt County Public Power district has filed application with state railway commission to construct a 29-mile transmission line from the Loup River substation at Fremont to the district's lines. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, Nebr., consulting engineer.

Iowa

ESTHERVILLE, IOWA — Dickinson-Emmet Rural Electric Project, M. A. Balkema, Emmet county agent, has filed application with REA for constructing 250 miles of rural transmission lines in Emmet, Dickinson and north half of Kossuth counties.

BELMOND, IOWA—City will hold a special election June 20 on a $120,000 bond issue to finance construction of a municipal light plant.

HULL, IOWA—City, G. S. DeMots, clerk, will hold a special election June 15 on a $14,000 bond issue to finance construction of a new well, water tower and pumping equipment.

KNOXVILLE, IOWA — Construction service, veterans administration, Washington, will receive bids until May 31 for new boiler plant at institution here, including boiler units and complete boiler house equipment.

MUSCATINE, IOWA—City is planning construction of a sewage disposal plant and sea wall; will make application for federal funds. Cost estimated at $1,000,000.

NEW HAMPTON, IOWA—City council has authorized plans for extensions and improvements in municipal electric power plant, including installation of new diesel engine generating unit and auxiliaries. Cost about $100,000. Ralph W. Gearhart, Cedar Rapids, Iowa, is consulting engineer. (Noted April 4)

WEST LIBERTY, IOWA—WPA funds totaling $10,928 have been allotted to the city, Charles J. Mackley, city clerk, to aid in construction of a power plant addition. The city also contemplates purchasing additional power plant equipment.

Colorado

ALAMOSA, COLO.—Public Service Co. of Colorado, Denver, has approved plans for extensions and improvements in steam-electric generating plant here, and will begin work immediately. A new steam turbogenerator unit and accessories, high pressure boiler and auxiliary equipment will be installed. Cost over $350,000. (Noted Oct. 11, 1937)

DENVER, COLO.—Bureau of reclamation will take bids May 31 for the following for the Glendive pumping plant, Buffalo Rapids project, near Fallon, Mont.: Two 36-inch motor operated gate valves; one deep well pumping unit; one rotary type vacuum pumping unit; one 10-ton traveling crane. On June 1 same office will receive bids for three 15,200-pound capacity gate hoists and one motor unit for Pomona siphon wasteway, Roza division, Yakima, near Pomona, Wash.

Pacific Coast

BURBANK, Calif.—Building permit has been issued to Lockheed Aircraft Corp., 1705 Victory boulevard, Burbank, for construction of a corrugated iron assembly plant. Estimated cost $14,000.

FRESNO, CALIF.—Western Pipe & Steel Co., 1815 Cherry avenue, Fresno, plans to build a new plant at cost of $150,000. Work will begin within 60 days. J. W. Hall is manager. The company is also building a new plant at Grand Coulee, Wash.

GLENDALE, CALIF.—City council has authorized plans for new municipal electric power plant. Cost estimated over $1,000,000. E. A. Ingham is city manager in charge.

LOS ANGELES—Standard Steel Corp. has been organized with 31,000 shares of capital stock. Directors are Robert S. Burns, William P. Mealey and Natalie Hill, all of Los Angeles. The firm is represented by Robert S. Burns, attorney, 411 West Fifth street, Los Angeles.

REDDING, CALIF.—Bureau of reclamation, Sacramento, Calif., will take bids until June 1 for construction of Shasta dam and hydroelectric generating plant about 14 miles from Redding. Specification 780.

EPHRATA, WASH.—City's proposed $200,000 water system improvement and sewage disposal plant project has been granted a $93,000 WPA grant by the state. An election will be held soon to pass on proposed bond issue. Project involves a 300,000 gallon concrete storage tank and a mile of 4 to 10-inch pipe. Parker & Hill, Seattle, engineers.

BREMERTON, WASH.—City will receive bids May 28 for proposed $30,000 storm and sanitary sewer system, including pumping equipment.

PULLMAN, WASH.—Board of regents, Washington State college, will take bids May 27 for reconstructing the foundry building and altering the mechanical engineering building.

SEATTLE—Board of regents, University of Washington, will take bids June 1 for construction of boiler house, coal storage wing and feed water wing, also piping, electrical work and coal conveyor equipment. Estimated cost $200,000. L. Bouillion, engineer, room 324, 1411 Fourth avenue building.